

NETWORK WORLD

The Newsweekly of User Networking Strategies

Volume 6, Number 7

An IDG Communications Publication

February 20, 1989

Companies mask ANI to calm callers

By Bob Wallace
Senior Editor

Fear of alienating customers has encouraged some companies to rethink the way they use ISDN's automatic number identification (ANI) capability.

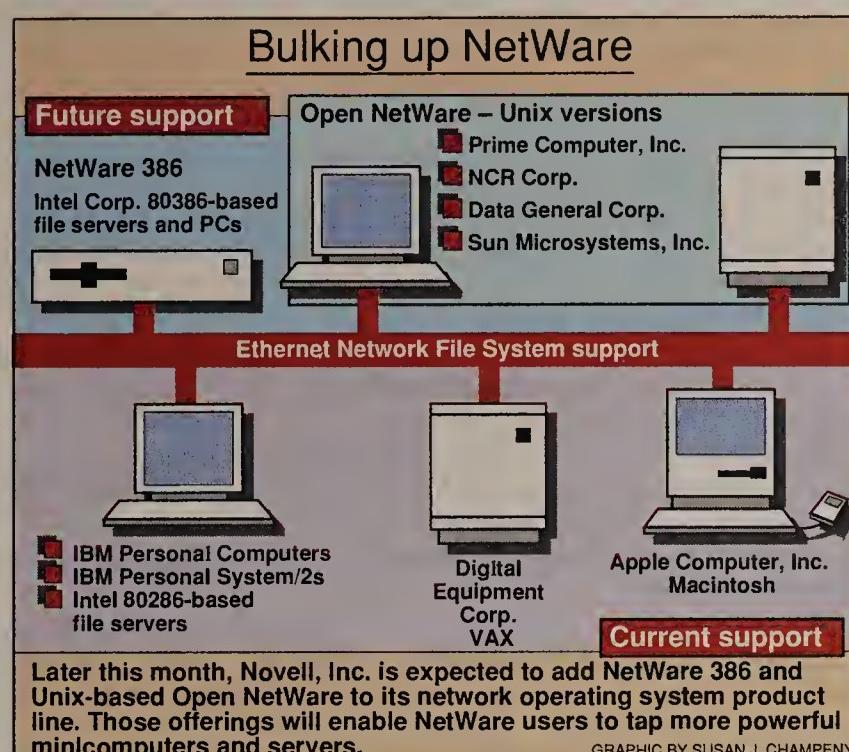
ANI, an Integrated Services Digital Network capability that has long been expected to whisk customer service into the 21st century, enables ISDN users to greet callers by name, a practice that sometimes spooks customers.

With ANI, the caller's telephone number arrives with the call, enabling telemarketing organizations to match the number with a customer data file and simultaneously deliver the call and the customer profile to an agent's terminal.

American Express Travel Related Services Co. (TRS), AT&T's first commercial ISDN user, reportedly found that customers were startled when some of its agents greeted them by name. TRS has since prohibited the practice.

Richard Zatarga, lead telecommunications engineer with TRS' Telecommunications Services Group, detailed TRS' early ISDN experiences for prospective ISDN users at a conference en-

(continued on page 43)



Novell to disclose partners for Unix-based NetWare

Company also close to releasing NetWare 386, a version designed for 80386-based servers.

By Laura DiDio
Senior Editor

BOSTON — Novell, Inc. is expected to announce next week that at least three vendors will license a portable Unix-based version of NetWare that Novell is developing with Prime Computer, Inc.

Novell will reveal at NetWorld '89 Boston that Sun Microsystems, Inc., NCR Corp. and Data General Corp. will license Open NetWare to run on their Unix-based workstations and minicom-

puters. Two weeks ago, Novell and Prime announced plans to develop Open NetWare, which runs as an application under Unix ("Prime, Novell to jointly build Unix-based NetWare," NW, Feb. 13).

While analysts and others briefed on the Novell announcement confirmed the three Open NetWare licensees, sources said as many as seven companies may reveal plans to use the software. Other vendors mentioned as pos-

(continued on page 43)

NETLINE



NY TEL IS ORDERED to share circuits with rival Teleport Communications. Page 2.

BANYAN OFFERS AN enhanced version of VINES as well as an application development tool kit. Page 2.

NOVELL SAYS it will license Sun's Network File System as Sun hosts a multivendor demo of the protocol. Page 5.

AT&T's Allen urges minimum regulation

Carrier's top exec calls for regulatory freedom, says MFJ restraints should remain on BOCs.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — In almost evangelical style, AT&T Chairman and Chief Executive Officer Robert Allen last week branded existing regulations as outdated and unnecessary and exhorted regulators to convert to a new way of thinking — minimum regulation.

Appearing before the Federal Communications Bar Association, Allen gave an impassioned speech, urging regulators to separate fact from fiction in deciding how to regulate carriers in the postdivestiture world.

Users respond to AT&T claims. Page 4.

"My message to regulators and other public policymakers is 'Regulate to the minimum.' Regulatory sense and legal sense do not have to be at odds with common sense," Allen said.

Divestiture drove "a clean wedge" between monopolistic local exchange activities and the competitive long-distance and equipment segments of the industry, he said. As a result, regulations should be steadily lifted from AT&T while the regional Bell holding companies remain

bound by the business restrictions placed on them by the Consent Decree.

Allen insisted there is no hypocrisy in this view. "There is (continued on page 8)

INSIDE:



Need tips on telecom management? See page 32.

Bankers win telco price concessions

By Jim Brown
New Products Editor

NEW ORLEANS — Banks are taking advantage of competition in the telecommunications market by pitting carriers against one another to win price concessions, network managers said at the American Bankers Association's Telecom '89 conference here last week.

While some users are focusing on AT&T's Tariffs 12 and 15 — the newest options in the carrier's portfolio — users at the show said there are a variety of ways to lower telecommunications costs. More than 300 network professionals attended the conference.

Some banks are playing inter-exchange carriers off one another to get new services and lower prices, while others are trying to reduce costs by striking custom

(continued on page 43)



Token-Ring vs. Ethernet: The battle continues

By John Hunter
Contributing Editor

When IBM announced the 16M bit/sec Token-Ring Network at Comdex/Fall '88 last November, some pundits predicted it would bury Ethernet. By their logic, while the 10M bit/sec Ethernet was faster and therefore better than the 4M bit/sec Token-Ring, the 16M bit/sec Token-Ring was better than both.

But speed isn't the sole de-

terminant of local net performance. In token-ring nets, transaction types, token length

and network loading are also important factors. It all comes down to how quickly stations are serviced.

"Token ring can be a problem when you have random requests and small message frames," says Banyan Systems, Inc.'s Barry Burke, product manager for packaged prod-

(continued on page 37)

NY Tel faces order to give local connections to rival

Teleport Communications gains access to circuits to link customers into its 180-mile fiber network.

By Bob Brown
Senior Writer

NEW YORK — The New York Public Service Commission (PSC) last week voted to order New York Telephone Co. to provide local-loop connections to Teleport Communications, a competing local carrier here.

The decision, which was reached after a two-year PSC investigation into intrastate telecommunications competition, could become a model for other states considering similar local-loop issues, observers said.

Under the ruling, Teleport Communications can use New York Telephone circuits to link customers to its 180-mile fiber network serving New York City and northern New Jersey. Teleport Communications currently has to run dedicated facilities to each customer.

\$100 million market

The PSC estimated the New York local-loop market to be worth \$100 million.

"New York City businesses will no longer have to put all their telecommunications eggs in one basket," said Robert Atkinson, Teleport Communications' vice-president of regulatory and ex-

ternal affairs. The carrier has turned away numerous potential customers in the past two years because it could not reach their locations, Atkinson said.

The PSC is expected to issue a comprehensive order at the conclusion of its investigation, which should be in about a month, Atkinson said. The first interconnected customer will probably come on-line around midyear, after tariffs are set, he said.

The order will require New York Telephone to file a tariff that will provide Teleport Communications and other carriers with interconnection arrangements. New York Telephone will initially work exclusively with Teleport Communications to hammer out link agreements, but other carriers will be free to compete in the future, Atkinson said.

Eventually, New York Telephone may be required to offer similar interconnection tariffs for switched services, he said.

No decision has been made yet on whether New York Telephone will have to allow Teleport Communications to install network equipment at its central office switch sites, Atkinson said.

In its decision, the PSC prom-
(continued on page 7)

Banyan upgrades VINES, offers software tool kit

Version 3.1 supports IBM 16M bit/sec local net.

By Laura DiDio
Senior Editor

WESTBOROUGH, Mass.—Banyan Systems, Inc. last week introduced a new version of its VINES local network operating system that supports IBM's 16M bit/sec Token-Ring adapter card and a tool kit for developing distributed applications.

In addition to supporting the new higher speed Token-Ring Network, VINES Version 3.1 supports application program interfaces (API) for third-party applications. The VINES Applications Toolkit is a set of tools that allows developers to create applications that take advantage of the APIs to run under VINES.

"Previously, it was difficult for third parties to write applications for VINES because we had no APIs," said Peter Simon, Banyan's vice-president of sales. "Developers had to write NET-BIOS-compatible applications that ran in VINES terminal emulation mode."

The VINES Applications Toolkit now lets developers create applications to run in VINES' native

mode, he said. "The tool kit will allow developers to write new applications, such as SQL data bases, fax gateways, network monitoring and management programs, and electronic mail gateways," Simon said.

Lee Doyle, manager of the LAN Program at International Data Corp. (IDC) in Framingham, Mass., said, "This will help end users immensely because they'll get applications that are optimized for network operation. Applications drive networks. The more applications users have to choose from, the more they can improve their businesses and the way they do business."

Doyle said the Banyan announcements are significant for the long term, adding that users will not see much immediate impact from the release of VINES Version 3.1.

"VINES Version 3.1 isn't meant to be a major enhancement over the earlier version," Banyan's Simon said. "The most important benefit of VINES 3.1 is that it supports the APIs that en-

(continued on page 5)

Briefs

PacTel gets Greene light. U.S. District Court Judge Harold Greene last week approved a waiver giving Pacific Telesis Group permission to buy 10% of an undersea transpacific cable, but he barred Nynex Corp. from purchasing a major share in another transoceanic cable.

Pacific Telesis was allowed to buy into International Digital Co., Inc., a Japanese carrier that is laying a transpacific fiber cable in conjunction with Pacific Telecom Cable, Inc. (not related to Pacific Telesis).

Greene prohibited Nynex, however, from acquiring Private TransAtlantic Telecommunications System, Inc., a McLean, Va., company that is planning a transatlantic cable with partner Cable & Wireless PLC of London. The acquisition would have given Nynex a 50% interest in the cable.

Looking for a few good users. The Information Technology Requirements Council (ITRC) last week said it is kicking off a membership drive to recruit large user and vendor corporations. Membership fees to sit on the ITRC, which oversees the North American MAP/TOP Users Group, are \$100,000 per year.

AT&T plans reorganization. AT&T last week said it plans to reorganize into 15 to 25 business units under five major operating groups. Each business unit will be accountable for its own profits and losses and will be headed up by a single executive. The five major operating groups are Communications Services, Communications Equipment, Data

Systems, Network Systems and International Services.

Chairman and Chief Executive Officer Robert Allen has assigned five top executives to determine the number of business units under each operating group. Planning will continue through 1989.

Botwinick to leave Unisys. Unisys Corp. said last week that Edward Botwinick, senior vice-president of Unisys and president of Unisys Networks, will retire at midyear. Botwinick, formerly chairman of Timeplex, Inc., is taking an early retirement, a Unisys spokesman said.

Until Botwinick's replacement is named, Unisys Networks' activities will be directed by James Unruh, Unisys executive vice-president and head of marketing, and Hollis Caswell, Unisys senior vice-president and head of technology.

Unisys Networks, one of three Unisys product business groups, is responsible for coordinating development of the corporation's overall network strategies. Timeplex, the core business of Unisys Networks, will remain under the direction of Victoria Brown, the company's president.

Tale of the TAT-8. MCI Communications Corp. last week began offering private-line voice and data communications services over TAT-8, the first transatlantic fiber-optic cable. Mobil Corp., MCI's first major TAT-8 customer, will use Fiberline T-1 services to link its voice and data networks in the U.S. and Europe. MCI's TAT-8 circuits can handle roughly 5,500 simultaneous calls.

CONTENTS

Industry Update

Removal of Consent Decree restrictions on the RBHCs will be among the most pressing items on this year's legislative and regulatory agendas, according to speakers at ComNet '89.

Page 9

Telecommunications

AT&T's introduction of the single, expandable Definity PBX could force arch rival Northern Telecom and other switch vendors to unify their product lines in order to keep pace.

Page 13

Data Communications

Users of two rival Systems Network Architecture net management products say the choice of which to buy depends as much on network requirements as on product features.

Page 17

Local Networking

DCA's Network Communications Group is now bundling its local- and wide-area net products as part of a push to offer turnkey integrated networks.

Page 23

Management Strategies

As a growing number of U.S. businesses expand abroad, more and more communications managers face the onerous task of building international nets, according to attendees at the recent ICA Winter Seminar.

Page 25

Products & Services

Data Switch expands its line of ChannelNet channel extenders with the introduction of a product that supports four IBM mainframe channels over 45M bit/sec T-3 facilities.

Page 27

Inside

Opinions

30

Letters

31

Networking Marketplace

47

Networking Careers

47

Network World wants you. If you have a news tip, please contact us. We'd also like to hear about unusual network applications and how you're optimizing your networks for performance or savings. Contact Editor John Gallant at (800) 343-6474, ext. 722, or through MCI Mail at 346-0258.

Network World
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
(508) 820-2543

Second-class postage paid at Framingham, MA, and additional mailing offices. Network World (USPS 735-730) is published weekly, except for a single combined issue the last two weeks in December by Network World Publishing Inc., 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.

To apply for a free subscription, complete and sign the qualification card in this issue or write Network World at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-620-7760.

Non-qualified subscribers: \$3.00 a copy; U.S. — \$95 a year; Canada, Central & South America — \$110 a year; Europe — \$165 a year, all other countries — \$245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label appearing on front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int'l, Periodical Entry Dept., 300 Zeb Road, Ann Arbor, Mich. 48106.

Network World is distributed free of charge in the U.S. and Canada only to qualified management or professionals who specify and maintain communications equipment and systems, including voice, data and video, as well as to common carriers, consultants, systems houses and manufacturers of communications equipment.

PHOTOCOPY RIGHTS: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by NW Publishing Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970.

POSTMASTER: Send Change of Address to Network World, Box 9172, Framingham, Ma. 01701-9172.

Copyright 1988 by NW Publishing Inc. All rights reserved. Reproduction of material appearing in Network World is forbidden without written permission.



Reprints (minimum 100 copies) and permission to reprint may be purchased from Nancy M. Shannon, CW Publishing Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

**"The
Data General
difference:
complete
communications
capability."**

Douglas A. Thom, Vice President
Packaging Division, Georgia-Pacific

CEO® is a registered trademark of Data General Corporation.
IBM® is a registered trademark of International Business Machines.
VAX® is a registered trademark of Digital Equipment Corporation.

For Georgia-Pacific's corrugated box plants around the country, a Data General computer network is the communications lifeline.

Nothing contributes more to the success of a geographically dispersed operation than good communications and networking.

For Georgia-Pacific's Packaging Division, the key role is played by a network of Data General systems spread out over 30 plants and corporate headquarters in Atlanta. In addition to handling the constant flow of initial entry, cost estimates and scheduling for the plants' orders, the network enables any of the more than 1000 employees on it to instantly and directly communicate. Whether they're in the same plant, one across the country, or in corporate headquarters in Atlanta. And employees who travel extensively can access their own systems from any location.

"Data General takes care of all our computing and networking needs," says Packaging Division Vice President Douglas A. Thom. "Their CEO® office automation is excellent. Their products are based on communications standards like SNA and X.400, so our Data General network also ties into our various IBM® systems, and to a Digital VAX® network in another division. And our Data General network is easily maintained by a small group at headquarters; we've found we don't really need support people in the field."

To find out how the Data General difference in computers and networks can work for you, send in the coupon below. Or call: 1-800-DATAGEN. In Canada, call 416-823-7830.



Data General

3400 Computer Drive, Dept. ADV/GP, Westboro, MA 01580

Name _____
Company _____
Address _____
City _____ State _____ Zip _____

CALL 1-800-DATAGEN

AT&T strives to banish 'dominant carrier' label

Carrier asks for regulation better suited to market.

By Bob Brown
Senior Writer

AT&T says it's no longer a dominant carrier and claims current regulations must be loosened to allow it to compete effectively against long-distance rivals and to better serve users' needs.

For the most part, users agree. In an interview with *Network World* last week, a top AT&T executive said regulations based on the belief that AT&T dominates the industry are keeping the carrier from offering users lower prices. In addition, said Lawrence Garfinkel, vice-president of AT&T's Business Markets Group, AT&T's rivals are using the regulatory system to hamstring the carrier and delay users' contracts.

"What we have now is an extreme penalty being paid because of the way in which AT&T is regulated," Garfinkel said. "Not only our customers but all customers in the marketplace are paying the price" (see "AT&T's Allen urges minimum regulation," page 1).

AT&T is not seeking total de-

regulation, Garfinkel said, but would like to shed the "dominant carrier" label given the company 10 years ago by the Federal Communications Commission.

AT&T was branded a dominant carrier in 1979 because it controlled the local exchange companies, and regulators were concerned that AT&T could use that control to subvert long-distance competition, he said. All other long-distance carriers were categorized as nondominant.

But Garfinkel said market conditions are dramatically different today and AT&T is no longer a dominant carrier.

As evidence, he said AT&T's share of the market for daytime business calling services has dropped from more than 90% to less than 60%. (AT&T said it currently has about 68% of the total long-distance market).

He also pointed to the financial strength of rivals MCI Communications Corp., which has annual revenue of about \$5 billion, and US Sprint Communications Co., whose annual revenue is

about \$3.4 billion. (AT&T's 1988 revenue was more than \$35 billion.)

AT&T's competitors are well-enough established that fears of predatory pricing by AT&T are unfounded, he said.

Brian Moir, counsel to the International Communications Association, which represents some of the largest communications users in the U.S., agreed that changes in the market must be reflected in the regulatory environment.

"The market has changed, and regulations ought to be modified in light of that," he said.

However, some users and industry groups remain skeptical. "Just because the market is competitive doesn't mean that AT&T is not dominant," said Catherine Sloan, director of legislative affairs at the Competitive Telecommunications Association, a Washington, D.C.-based trade association for long-distance carriers.

Tag team partner

According to Garfinkel, AT&T's competitors are fighting AT&T through the FCC, asking the agency "not just to be the referee, but a tag team partner."

In illustrating his point, Garfinkel cited the case of General Electric Co., an early AT&T Tariff 12 customer.

AT&T beat out a rival for GE's business in November 1986 by using Tariff 12, which lets it offer custom service packages to large users. The loser in the bidding process tried to tie up the award through the regulatory process, Garfinkel said.

As a result, GE faced a four-month delay in getting AT&T services and had to put business plans tied to the services on hold, Garfinkel said. AT&T's Tariff 12 network for GE was allowed to go forward in August 1987; the FCC is still investigating the legality of the tariff.

A by-product of these regulatory contests, he said, is that other users become wary of entering into such deals with AT&T out of fear that their contracts could be delayed by the FCC.

Stan Welland, GE's manager of corporate telecommunications in Bridgeport, Conn., said a similar situation is brewing now thanks to MCI's recent protest of the Federal Telecommunications System (FTS) 2000 contract. AT&T won 60% of the deal.

FTS 2000 promises to save the government and taxpayers money, but these benefits will probably be delayed, said Welland, whose company uses AT&T, US Sprint, MCI and other carriers.

"Here we go again," Welland said. "When does the regulatory

process catch up with the needs of both the private sector and public sector users?"

FCC consideration of Tariff 12, Tariff 15 and Tariff 16 (under which AT&T is attempting to provide FTS 2000) is a sign that policymakers are beginning to recognize the changes taking place in the market, Garfinkel said.

Users agree

In general, users agree with AT&T that it should be able to file tariffs such as Tariff 12 in order to compete more effectively. James Blaszak, counsel to the Ad Hoc Telecommunications Users Committee, a group of major users, said AT&T deserves some breathing room.

"I think AT&T is perfectly justified in asking for flexibility to meet the competition," Blaszak said. "I believe that AT&T's competitors are offering discounts off generally applicable tariff rates to particular customers to get their business, and AT&T needs some way to respond."

The benefits of letting AT&T compete aggressively for the business of large users can pay off for small users as well, GE's Welland said. GE and AT&T, for example, worked together to develop AT&T's Bandwidth Management Service, which is now available to all users. □

Phone 800



There's A Big Difference Between The Cost Of Installing AT&T's READYLINE® 800;

Right now, US Sprint's new FONLINE 800™ comes with a feature every small business can appreciate: free installation.*

Which means you'll save

\$97.50 versus AT&T.

Every month thereafter, FONLINE 800 lets you save up to 13% versus AT&T, with lower service charges and tapered rates that go down as call

volume goes up.

FONLINE 800 gives you the sound quality of Sprint's 100% digital Fiber Optic Network (FON), preferred by 9 out of 10 business people versus AT&T.

Novell joins supporters of Sun's NFS

By Susan Breidenbach
West Coast Bureau Chief

SANTA CLARA, Calif. — Novell, Inc. last week said it has licensed Sun Microsystems, Inc.'s Network File System (NFS), capping a week of NFS interoperability demonstrations here involving 65 hardware and software firms.

Sun's five-day Connectathon '89 conference showed impressive industry support for NFS, evidence that Sun has nurtured the protocol into an industry-accepted mechanism to share files among different vendors' architectures.

Apple Computer, Inc., Cray Research, Inc., Data General Corp., Digital Equipment Corp., Hewlett-Packard Co., IBM and NCR Corp. were among the NFS supporters demonstrating interoperability of their products.

By supporting NFS, Novell will enable NetWare users to integrate workstations that support the protocol into their local networks. The agreement should also be instrumental in expand-

ing NFS into this traditional segment of the local network market, said Bill Keating, director of technology marketing for Sun.

The show's objective was to test each vendor's NFS-based server against every NFS client, which could be a personal computer, workstation or other device not acting as the server. The vendor participants tested 9,025 client/server pairings for NFS interoperability, but results of those tests were not available at press time.

While many users are still awaiting interoperable products that comply with the Open Systems Interconnection protocol, NFS can deliver multivendor interoperability today, said Lou Delzompo, marketing manager of network products for Sun's software division.

"NFS is not some emerging standard that these vendors are promising to support at some point," he said. "They are demonstrating that they already support it."

NFS provides users with transparent access to remote files on any number of different NFS-supported platforms so that data anywhere on the network appears to be local.

The protocol is part of Sun's Open Network Computing (ONC) product family. Other ONC ser-

vices include a Remote Procedure Call (RPC) capability that lets users execute commands or programs on remote systems.

Together, Sun's NFS, NeWS graphical user interface and RPC technologies "provide a distributed-application platform that is available today," Delzompo said.

NFS delivers the same capabilities proposed by Microsoft Corp. in its OS/2 LAN Manager.

Traditionally, Connectathon '89 is held two weeks before the winter Uniforum trade show. It was established three years ago to give vendors a chance to test the NFS products they intended to demonstrate at Uniforum and make necessary adjustments.

Now though, Connectathon has emerged on its own as an NFS interoperability testing ground.

Operating systems involved in Connectathon '89 include DOS, OS/2, the Macintosh OS, VM, MVS and VMS. Ethernet, token-ring, AppleTalk and Integrated Services Digital Network connectivity options were demonstrated.

Cray Research demonstrated NFS connections over the longest link. Rather than hauling its supercomputers to the event, the company used a T-1 line to enable other vendors' NFS clients to access a Cray II and Cray X-MP located in its Minneapolis headquarters. □

Banyan upgrades VINES

continued from page 2
able developers to write applications that run under VINES."

VINES Version 3.1 is due out next month and will support IBM's 16/4 Adapter in both IBM Personal Computer XT- and Personal System/2 Micro Channel-based workstations. It will also support 3Com Corp.'s 3C603 token-ring interface card.

Additionally, VINES Version 3.1 will support MS-DOS Version 4.0 clients. The latest version of VINES supports DOS-based clients running any version of Personal Computer MS-DOS, from Version 2.1 through Version 4.0, Simon said.

VINES Version 3.1 costs \$4,995. There is no upgrade charge for VINES Version 3.0 users that purchased a VINES service contract. The VINES Applications Toolkit ranges from \$750 to \$1,995, depending on options.

Banyan's ONCE strategy

Simon said the introduction of VINES 3.1 and the tool kit further the company's so-called Organizational Network Computing Excellence (ONCE) strategy, which is designed to meet users' expanding local network needs.

As part of the four-pronged

ONCE strategy, Banyan will provide new products and tools to enhance VINES and expand the array of software that works with the network operating system.

Simon said a second portion of ONCE calls for Banyan to forge alliances with hardware and software vendors over the next year to expand the reach of VINES into other environments such as Unix workstations and Apple Computer, Inc. Macintoshes.

"It's no longer enough for network vendors to impose proprietary products on end users. We'll announce about five new alliances within the next 12 to 18 months," Simon said.

The first alliance, analysts said, will be with software vendor Oracle Corp. Banyan and Oracle plan to introduce a jointly developed SQL data base management system, IDC's Doyle said. The SQL DBMS will run on Banyan and other servers.

Simon would not confirm the specifics of the Oracle alliance. "We're talking to all the major software vendors including Oracle, Ashton-Tate [Corp.] and others."

Other elements of the ONCE program entail expanding the current network planning and distribution services, and increasing training and support for users. □

FON 800

And Our F^{ONLINE} 800.SM

help you control costs.

So, if you're thinking about an 800 service for your business or if you thought you were too small to afford one, call US Sprint.[®]

F^{ONLINE}'s free call detail lets you see exactly when and from where every call comes. And our optional management reports give you quick, easily understood summaries that

Our new F^{ONLINE} 800 with free installation can make a big difference if you have a small business. 1-800-877-2000.



US Sprint.
Talk With The Best.SM

Bankers create group to promote wider use of EDI

Members hope to profit from electronic services.

By Barton Crockett
Senior Editor

BALTIMORE — The National Automated Clearinghouse Association (NACHA) formed a group recently to help banks cash in on selling advanced electronic data interchange (EDI) services to their customers.

The Bankers' EDI Council will be an arm of NACHA, which is based here. NACHA oversees the electronic funds transfer networks jointly owned by more than 17,500 financial institutions in the U.S. Collectively, these networks processed more than 1.2 billion electronic funds transfers last year, NACHA officials said.

According to executives from NACHA and bank officials, the primary goal of the Bankers' EDI Council is to educate banks on ways to profit from providing EDI services.

The group also plans to work with organizations such as the ANSI X12 EDI committee on standards issues and to specify subsets of existing EDI standards that financial services firms will use. In addition, the Bankers' EDI Council will prepare a directory listing the types of EDI services that U.S. banks support, said William Nelson, senior director of network services at NACHA.

EDI and EFT

Institutions interested in joining the Bankers' EDI Council last week applauded the group's mission to help banks provide EDI services along with electronic funds transfers — a step many banks are eager to take.

Currently, most U.S. banks support a variety of electronic funds transfer applications. For example, companies can ask a bank to transmit payments to the banks of multiple suppliers or to electronically pool money deposited in regional banks into a single, larger account.

Financial institutions want to expand these services by transmitting documents such as purchase orders, invoices or remittance statements along with electronic payments. To do this, banks throughout the country must be able to receive EDI messages with electronic funds transfers and then pass this data on to their customers. Currently, few banks have this capability.

"If I want to send invoices along with electronic payments to the banks of my customers' suppliers, these banks better have EDI systems that can handle this," said Thomas Gregory, assistant vice-president with Philadelphia-based CoreStates Financial Corp. "Unfortunately, most don't."

Standards for these types of

single electronic payment sent from one bank to another. Another NACHA standard, the Corporate Trade Exchange, lets users attach ANSI X12 EDI documents to payments sent between banks.

Gregory estimated that only about 150 U.S. banks have adequate systems for handling Corporate Trade Payments. About 15, he said, can handle Corporate Trade Exchange messages.

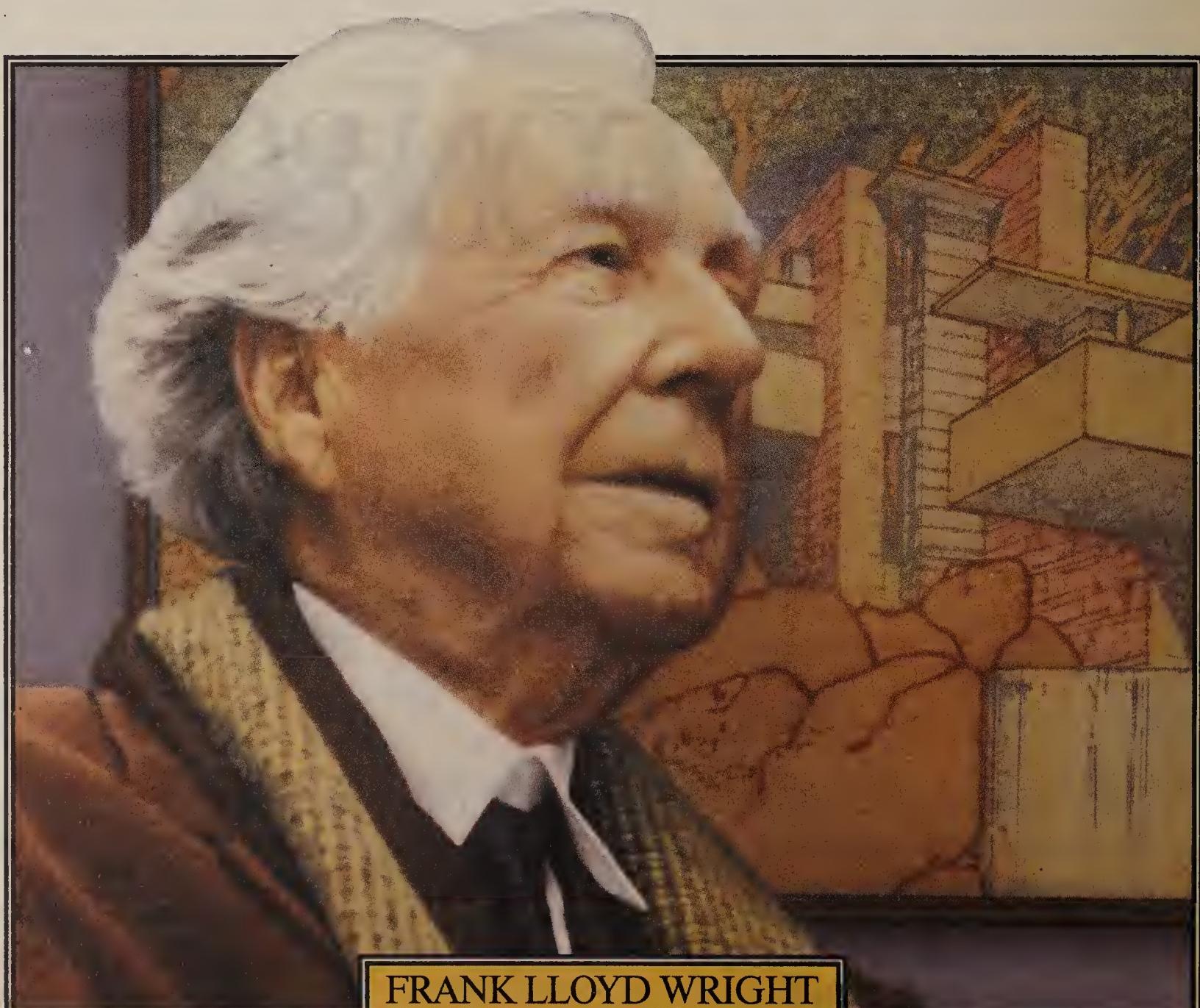
This lack of support has kept

CoreStates from pulling in much revenue from an EDI service it sells called CorePay, Gregory said. The product is based on these NACHA standards and lets customers attach invoices to electronic payments.

"CorePay brings in minimal revenue," Gregory said. "I have to tell potential customers that unless their suppliers' banks can handle it, it really isn't going to do much good."

A formal mission statement and bylaws for the Bankers' EDI Council have yet to be established. Membership will be open to any bank, savings and loan or other depository institution that pays an annual \$1,295 fee. Since the group's inception roughly two weeks ago, Nelson said two banks have committed to joining. He expects another 15 to 20 by June and dozens more to sign up in subsequent months. □

We Redesigned The Architecture Of Dial-Up Network Modems.



FRANK LLOYD WRIGHT

Frank Lloyd Wright, American architect, 1867-1959. His pioneering efforts with new materials, systems, and structures overturned the "classically" decorative architectural standards of the nineteenth century—and redefined the concept of "house." Wright's humanistic, functional, open-structure philosophy revitalized the entire field, and his principles have become the essence of modern American architecture.

NY Tel to give local connections

continued from page 2

ised New York Telephone pricing flexibility to compete on level ground with interconnected competitors. The extent of this flexibility has not been determined.

Teleport Communications is assuming that New York Telephone will not try to undercut it or resort to unfair competition,

according to Atkinson.

New York Telephone officials are studying the decision and were not available for comment, a company spokesman said.

The decision is significant for existing Teleport users, said Gary Bacher, senior vice-president for London-based International City Holdings' two divisions in New York, MKI Securities Corp. and Fulton Prebon (USA), Inc.

The entrance of interconnect-

ed carriers signals the potential for greater competition among local carriers, Bacher said.

It also will provide security-conscious financial firms in New York with a solid option for disaster recovery and rerouting services, he said.

Analysts said it is too early to gauge the significance of the decision because tariffs have not been set and the collocation question is lingering. □

AT&T to cut long-distance rates by \$533m per year

By Wayne Eckerson
Staff Writer

WASHINGTON, D.C. — AT&T last week filed a tariff with the Federal Communications Commission that would lower long-distance rates by \$533 million

annually beginning April 1.

The carrier said rates for basic long-distance service would drop by an average of 1.6% and rates for business-oriented services would decrease more. However, rates for direct-dial long-distance calls between locations less than 292 miles apart would rise 4.7%, AT&T said.

The planned rate reductions are the result of a scheduled decrease in access charges that AT&T and other long-distance companies pay to local carriers. The access charge reduction is slated to go into effect April 1.

Analysts said the price cuts are part of AT&T's continuing effort to close the pricing gap with MCI Communications Corp. and US Sprint Communications Co. in the lucrative business market.

"The announcement fires the opening salvo in a new, bloody marketing war between the major carriers," said Robert Self, president of Market Dynamics, a New York consulting firm. "This year will be the fiercest ever in terms of long-distance competition."

In addition to rate reductions, AT&T said it plans to slash the monthly charge for Megacom WATS and Megacom 800 from \$870 a month to \$50 a month.

AT&T also announced a 3.9% average price reduction for AT&T WATS, a 3.8% reduction for Pro WATS, a .9% decrease for basic AT&T 800 Service and a 3.3% decrease for AT&T Readyline.

"The price reductions enable AT&T to close marketing loopholes that have given their competitors an advantage," Self said.

For example, AT&T plans to charge virtually the same rate for the first minute of a basic long-distance call as it does for each succeeding minute, Self said.

This is an attempt to derail MCI and US Sprint advertising campaigns that claim their rates are 20% to 30% below AT&T's. The advertisements do not state that the cost comparisons were made only for the first minute of a call, Self said. AT&T currently charges about 30 cents more than the other carriers for the first minute of a long-distance call, he said.

The price cut announcement coincides with the final hike in monthly subscriber line charges that businesses and residences pay to local carriers. Residential subscriber line charges will increase 30 cents, from \$3.20 to \$3.50 a month. Businesses will continue to pay \$6 monthly per-line subscriber charges.

"This tariff probably marks the end of the line for decreases in off-peak residential long-distance rates," Self said. "On the other hand, prices will continue to drop for daytime calls and business services because that is where the profits are." □



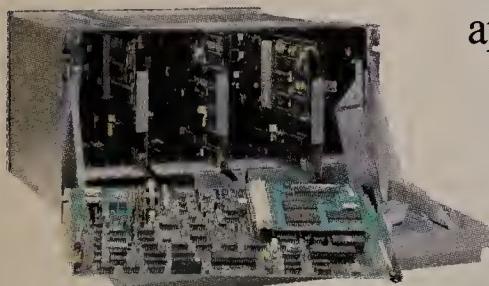
rank Lloyd Wright shook the foundations of American architecture with bold new ideas about form, function and freedom. Because modern families and businesses needed modern, innovative structures to house them.

Racal-Vadic has similarly broken new ground in data communications. Because modern networking strategies need new, *network* modems to support them.

A New Foundation For The New Networks

Our blueprint for success is the All-In-One Architecture™. The only unified system of chassis, modems and accessories designed specifically for today's multiple network architectures and demanding on-line applications.

Like high density, self-configuring modems to serve digital PBX and LAN-based modem pools. Error correction and remote network management, for global Electronic Funds Transfer systems. Asynchronous and synchronous auto-dialing for remote mainframe access or switched-network SNA applications. Fast-connect modems for Point Of Sale transactions and credit verification. Even integral call-back security for work-at-home applications.



The All-In-One Architecture lets you mix sync and async modems and accessories in a single, high density, front-loading chassis.

CommPresso™ data compression, to our 4800bps and 9600bps modems with SADL™, the Synchronous Auto-Dial Language.

There's even a choice of system chassis. The VA1682 for local, centralized applications, or the MDS II Network Management version for remote control of up to 16,000 modems in distributed chassis networks. Both are front-loading, for changing cards without recabling or powering down. Both offer you the highest rack density in the industry. And both are fully compatible with other popular network components.

A Lasting Tradition Of Building To Last

Nobody knows rack-mount dial-up systems better than Racal-Vadic. We've installed more than 50,000 chassis and 600,000 modems in the field—more rack-mount devices than all of our competitors. Combined.

And Racal-Vadic is committed to making all of our new rack-mount products compatible with the All-In-One Architecture. Which means that future modems will plug right into the chassis you've already installed.

So call 800-482-3427 today. And see how easily you can move into the network modem architecture of tomorrow.



The intelligent front panel offers complete management and diagnostic functions for every modem in the system.

Racal-Vadic

THE DIAL-UP AUTHORITY

RACAL
The Electronics Group

1525 McCarthy Boulevard, Milpitas, CA 95035 • Tel (408) 432-8008 • TWX: 556-409 RAVA MLP

All-In-One Architecture and SADL are trademarks of Racal-Vadic. MNP and CommPresso are trademarks of Microcom, Inc. and Adaptive Computer Technologies, respectively.

Racal melds its subsidiaries in corporate reorganization effort

By John Cox
Senior Editor

FORT LAUDERDALE, Fla. — The Racal Corp. last week confirmed it will merge its Racal-Vadic subsidiary with its larger Racal-Milgo subsidiary as part of a corporate reorganization.

The move is intended to allow Racal, part of Racal Electronics, plc of Berkshire, England, to create a single coordinated marketing approach to the U.S. modem market, according to Edward Cheatham, vice-president of corporate communications for Racal, based here.

The Racal-Vadic name, gracing the front of dial-up modems since the 1970s, will continue to be used on products. But all sales and marketing of the Racal-Vadic products will be taken over by Sunrise, Fla.-based Racal-Milgo, which builds leased-line modems and network management systems.

Josh Gonze, a data communications analyst with International Data Corp., a Framingham, Mass., market research firm, said the British parent endorsed the merger as a cost-cutting move in the fiercely competitive U.S. modem market.

The manufacturing and engineering facilities of Racal-Vadic, based in Milpitas, Calif., will become a manufacturing technology center for the Racal Data Communications Group.

The actual merger of Racal-Vadic's sales and marketing functions into those of Racal-Milgo began about a month ago. The reorganization is expected to be completed by the end of next month. No decisions have been made concerning whether or not the changes will lead to layoffs, Cheatham said.

For the first six months of the current fiscal year, Racal Data Communications Group reported revenue of \$254 million, up just 2% from \$250 million for the comparable six-month period a year before. Total revenue for the current fiscal year is projected to be about \$500 million. □

AT&T's Allen urges minimum regulation

continued from page 1

clearly a difference between AT&T and the [RBHCs]," Allen said. The Consent Decree restrictions, which prohibit the RBHCs from competing in long distance, information services and manufacturing, were put in place to prevent antitrust violations. Telephone company regulation, on the other hand, is designed to protect customers from price discrimination, among other things.

Allen said that although competition in the long-distance market has intensified since divestiture, the RBHCs are still monopolies. Consequently, they "could potentially do a lot of damage to competitors in markets protected by the core restrictions," he said.

He attacked as "myth" the argument that freeing the RBHCs to compete in all areas will make the U.S. more competitive. Allen claimed that if the RBHCs were allowed to manufacture, they would likely form alliances with foreign competitors, which would do little to solve the trade deficit. He warned that manufacturers would be discouraged from putting money into research and development if the RBHCs could manufacture their own equipment, because RBHC-made products would be given preferential treatment.

Brian Moir, a Washington attorney who represents the International Communications Association, said this is the first time a senior-level officer of AT&T publicly "laid down the gauntlet" to the RBHCs on the issue of Consent Decree restrictions. "[Allen's] message about the MFJ is going to be well-received by the majority of the industry, and it's something we've looked forward to hearing from the highest levels of AT&T for some time," Moir said.

In his speech, Allen complained that requiring AT&T to offer service through public tariffs is tantamount to offering competitors a guidebook to AT&T.

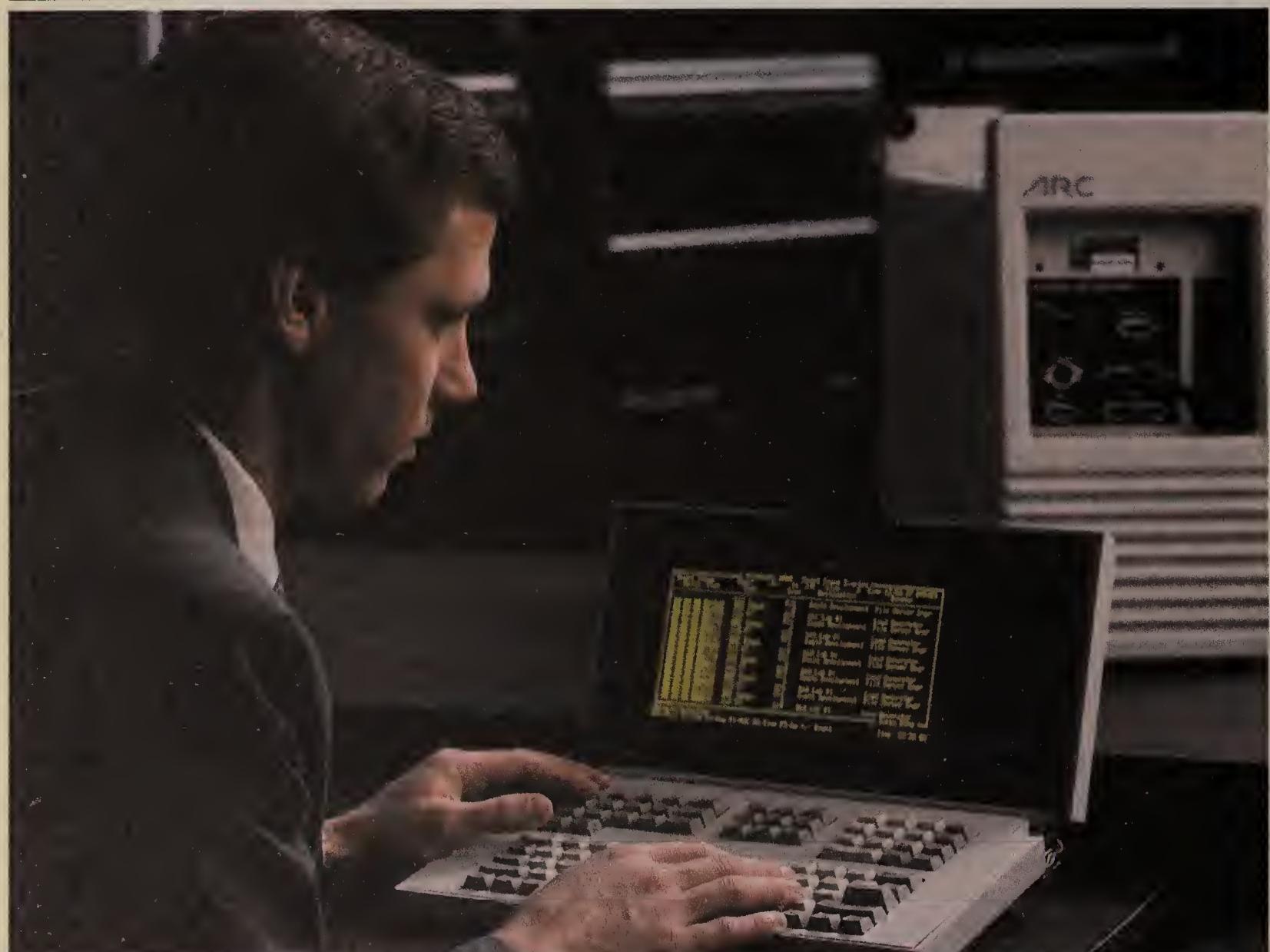
The tariffs not only give other long-distance carriers access to information on new AT&T services and pricing structures, but they also give competitors a way to slow down AT&T, he said. AT&T officials have long complained that competitors object to tariffs solely to hold up the introduction of new AT&T services.

Even though AT&T officials feel the current regulatory structure is outdated, Allen insisted his company is not seeking deregulation — just less regulation. "We need more than the slow peeling of the regulatory onion. We need a new onion with competitive skin," he said.

"If AT&T was classified as a nondominant carrier and treated the same [as competitors], it would fulfill my expectations for minimum regulation," Allen said. AT&T has 68% of the total long-distance market, he said, and holds even less in the large business user market. "Dominant status doesn't make sense for [AT&T]," he said (see "AT&T strives to banish 'dominant carrier' label," page 4).

However, Allen said, AT&T has no plans to ask the FCC to reopen its Competitive Carrier Decision, which labeled AT&T a dominant carrier and required the filing and approval of tariffs for new services.

Allen acknowledged that the FCC has a legitimate role in regulating areas in which customers have few choices, but he insisted that the market for large users is very competitive. Customers do not want to depend on a special tariff in order to do business with AT&T, he said, declaring that users are tired of the regulatory "hassle." □



Now you can have the same high performance analyzer for Token Ring LANs that ARC pioneered for WANs

For the past twenty years, Atlantic Research has been providing users with the highest quality data and protocol analyzers in the industry.

Now you can have this same expertise designed into our new INTERVIEW® 1000 Token Ring Network Analyzer.

It's not just an office pc adapted protocol analyzer, our unit was designed from the ground up specifically to monitor and evaluate Token Ring LANs.

It's more rugged and provides more advanced capabilities for LAN troubleshooting than any other unit on the market. The INTERVIEW® 1000

can provide vital information on network utilization, configuration, errors and network management for:

Network Operations

- installers
- system administrators
- maintenance

Network Developers

- planners
- system integrators
- LAN developers

So, if you want to keep your Token Ring LAN at peak performance, you should investigate the benefits provided by ARC's INTERVIEW® 1000 Token Ring Network Analyzer.

Call or write today for more information or a demonstration. Atlantic Research Corporation, Teleproducts Division, 7401 Boston Boulevard, Springfield, Virginia 22153. Telex: 197733 ARC TP.

Call 800-368-3261

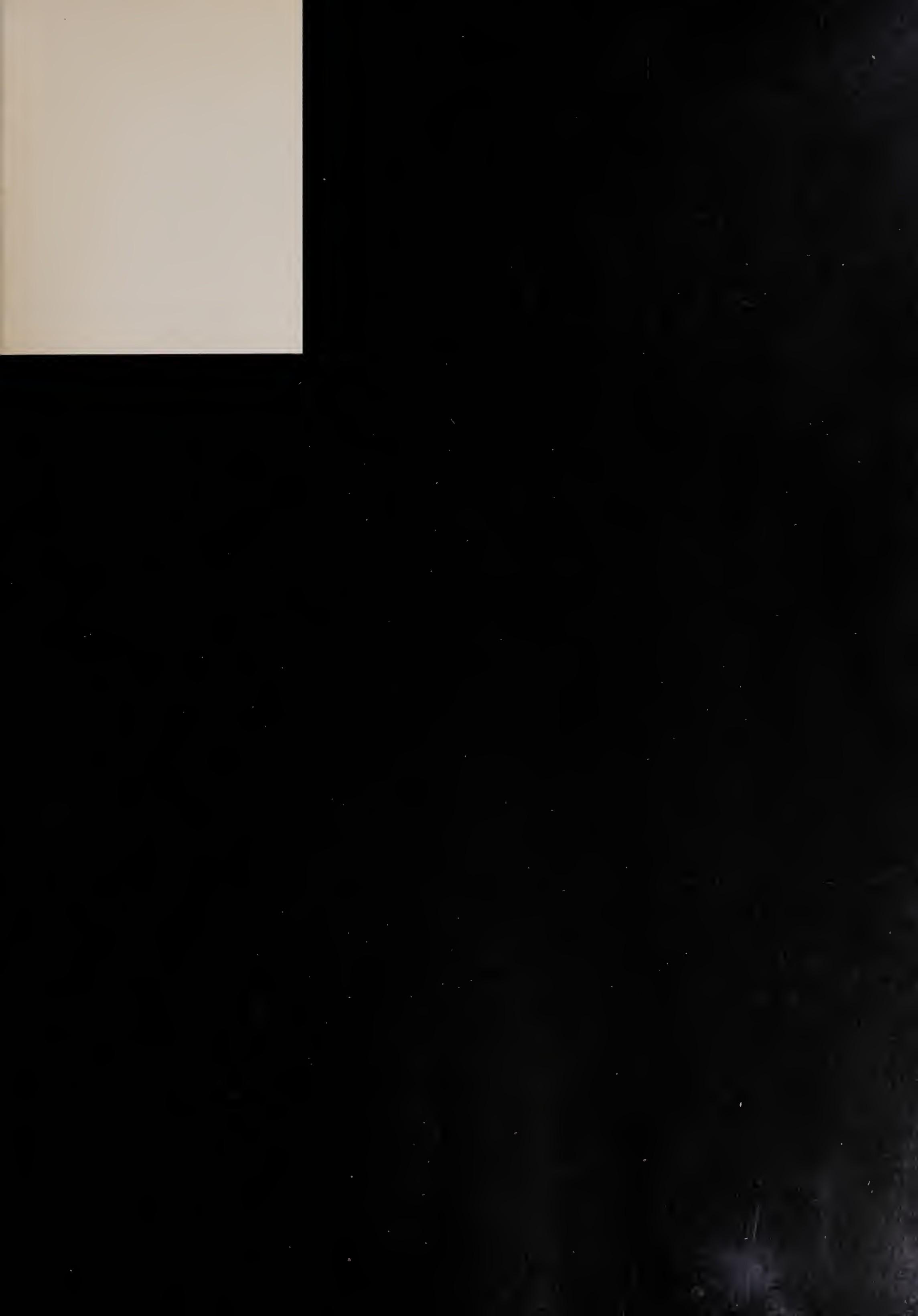
(In Virginia, call 703/644-9190)

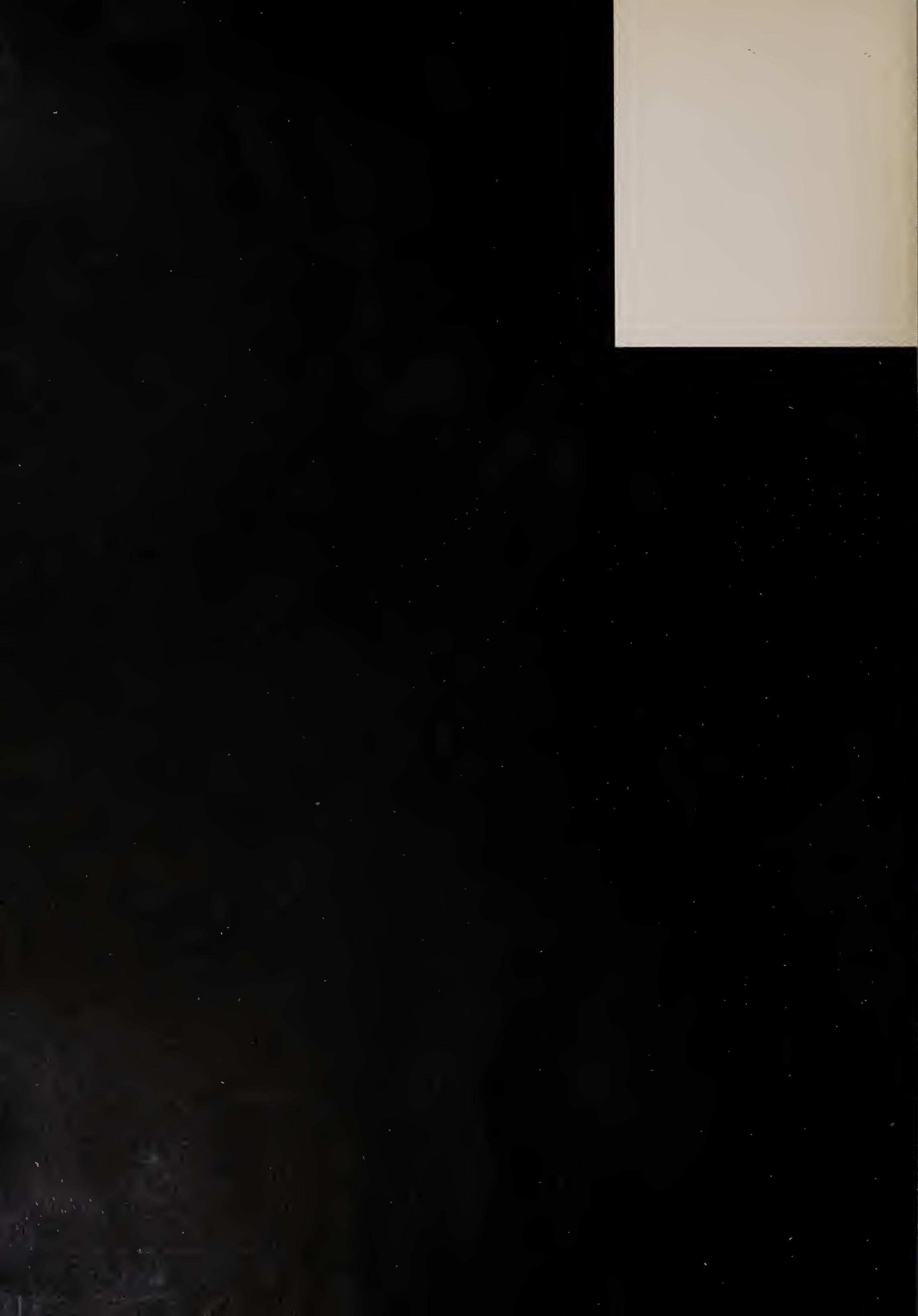


Atlantic Research Corporation

a subsidiary of Sequa Corporation

ARC... We Make Networks Work





INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

"The early disappointments in the VSAT market are history. We think the slower than expected growth rates were an artifact of the VSAT product life cycle, somewhat analogous to the early growth of the personal computer."

Excerpt from "The Report on VSATs," a recent study from Satellite Systems Engineering, Inc., a telecommunications consulting firm in Bethesda, Md.

People & Positions

VMX, Inc. of San Jose, Calif., last week announced the appointment of **Harry Budow** to executive director of European Operations.

Budow's responsibilities include managing the sales, training, technical support and distribution relations of VMX's European base. Budow most recently served as VMX's director of marketing — voice automation.

Carey Heckman last week was named general counsel at **Excelan, Inc.**, a San Jose, Calif.-based local network equipment maker.

The firm said it created Heckman's position to ensure prompt attention to legal issues as the company grows. Previously, Heckman was a partner in Palo Alto, Calif.-based Ware & Freidenrich, Exclan's outside legal counsel for the last six years.

Contel Corp. announced that **Donald Marsh**, the firm's vice-president — technology, was appointed to a U.S. Congressional Advisory Panel of a special board reporting to the Office of Technology Assessment (OTA).

The panel's function will be to advise the OTA of the impact of new information technology on science and engineering research. □

American Airlines, Delta set to link reservation nets

Airlines to merge nets under separate company.

By Wayne Eckerson
Staff Writer

DALLAS — American Airlines, Inc. and Delta Air Lines, Inc. recently announced plans to merge their computer reservation nets under a jointly held subsidiary.

Delta has agreed to pay AMR Corp., American's parent company, \$650 million for the right to merge its Datas II network with American's SABRE system, the world's largest reservation net. Prior to the merger, the Datas II network had been one of the smallest U.S. reservation systems ("AMR, Delta hammer out deal to link their reservation networks," NW, Feb. 6).

The joint venture will likely increase the competitiveness of both airlines in the international reservations market, which is dominated by systems owned by two or more carriers.

Separately, the agreement brings American a hefty cash infusion as well as relief from U.S. regulatory authorities, who say that SABRE gives American an unfair competitive advantage in the domestic market. Regulators have criticized single-owner res-

ervation networks such as SABRE and Datas II for creating an unfair link between an airline and its reservation system, according to spokesmen from both airlines.

Analysts said the deal will give Delta a quick leg up in the reservations market, in which it has tried with little success to increase its share in recent years.

The agreement also leaves open the possibility that other domestic and foreign airlines could buy up to 50% equity in the venture. American and Delta officials have not yet talked with representatives from other airlines, but they expect several to express interest, a Delta spokesman said.

One of the first assignments the new company's management will tackle is to appoint a task force that will formulate a plan to merge the SABRE and Datas II nets, a Delta spokesman said.

Consultants said it is likely Delta will fold its network into the much larger SABRE system. Should the task force recommend such a plan, Delta would likely shut down its main Datas II hub in Atlanta and transfer it to Tulsa, (continued on page 12)

INDUSTRY BRIEFS

As part of an ongoing corporate restructuring announced last December, **Northern Telecom, Inc.** said it laid off 100 employees from its Minnetonka, Minn., manufacturing plant last week and will release another 300 employees by year end.

The job cuts will be made throughout the Minnetonka facility and will affect factory workers and managers, a company spokesman said. About 200 Northern Telecom employees will remain at the location to perform service jobs.

Northern Telecom plans to consolidate its Minnetonka-based operations with existing facilities in Santa Clara, Calif., and Research Triangle Park, N.C., the spokesman said. The consolidation will allow equipment to be built nearer to the factories that assemble the finished products, he said.

A variety of products, including printed circuit cards and the integrated voice/data components used in Northern Telecom's Meridian telephone switches, are built at the Minnetonka plant.

Northern Telecom employs about 22,000 people in the U.S. in 13 manufacturing plants, 14 research and development centers and in marketing, sales and service offices nationwide.

Excelan, Inc., a San Jose, Calif.-based local network maker, last week said it has merged its **Kinetics, Inc.** division's marketing organization with that of the parent company.

The new, larger marketing group will have two areas of responsibility: corporate marketing and business marketing.

Corporate marketing, which will be headed by Exclan Vice-President Duane Murray, will involve product development and corporate communications for desktop products, server offerings, distributed applications and protocol analyzers.

Business marketing, led by Exclan Vice-President Timothy McCreery, will involve market development, including channel development and third-party relationships such as those now in effect with Oracle Corp. and Novell, Inc. □



(Left to right) William McGowan, Robert Johnson, Peter Huber, William Ferguson and Patricia Diaz Dennis at ComNet '89.

Speakers want MFJ restraints loosened

ComNet attendees blame vacant FCC posts, bad FCC-Congress relations for RBHCs' binds.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Removal of Consent Decree restrictions governing the regional Bell holding companies will be one of the most pressing items on legislators' and regulators' agendas this year, according to speakers at the recent Communication Networks Conference and Exposition (ComNet) '89 here.

Although all at the show agreed that the timely resolution of this issue would be in the best interests of users, vendors and the country, many expect action to be slow in coming due to vacancies in key policy positions at the Federal Communications Commission, the Department of Justice and the National Telecommunications and Information Administration (NTIA).

The topic was the subject of debate at a ComNet session called the "Town Meeting," an annual event that draws a large crowd.

Tom Cohen, senior counsel on the U.S. Senate Commerce Committee, said Congress is paralyzed by the lack of consensus about removing RBHC business restrictions. Congress has turned to the industry for guidance because the electorate had not voiced strong concern, but it has found no consensus there either, he said.

Complicating the problem is the strained relationship between Congress and the FCC. "If [Congress] felt the FCC was more responsive, you would be more likely to see legislation giving them more control" over the business restrictions, Cohen said.

Walter McCormick Jr., minority chief counsel and staff director for the Senate Commerce Committee, agreed. "I think everyone would agree that it makes

more sense to have telecommunications policy handled by an expert agency rather than a federal judge."

But McCormick predicts there will be no need for legislation removing the business restrictions. During the next triennial review, scheduled for 1990, U.S. District Court Judge Harold Greene will likely incorporate the majority of proposals put forth by Congress this year, he said.

Henry Geller, director of the Washington Center for Public Policy Research and a former member of the FCC and the NTIA,

"I thought [the restrictions] were dopey then, [they're] wrong now," Geller said.

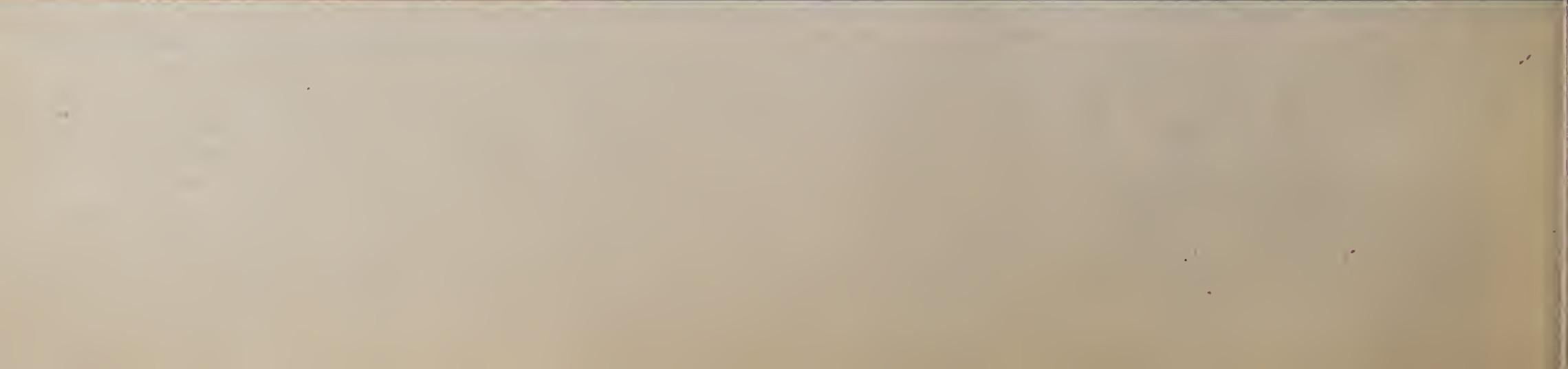
▲▲▲

strongly supports removal of the restrictions but doubts Congress will act. "I thought [the restrictions] were dopey then, [they're] wrong now," he said, adding, "I won't live long enough to see legislation in this field."

Geller acknowledged that the RBHCs are still monopolies but said that regulations will never be able to completely shield competitors. Leaving the restrictions in place harms consumers and stifles innovation, outweighing industry gains from restraining possible anticompetitive behavior, he said.

Peter Huber, a senior fellow at the Manhattan Institute who wrote a lengthy study for the De-

(continued on page 12)



For an educational institution, nothing is more important than the smooth exchange of information. That's why many colleges are making information networking a top priority.

The toughest challenge is connectivity. Colleges and universities, like most places, acquire computers and telecommunications hardware in patchwork fashion, ending up with

little or no compatibility.

For one northeast college, AT&T Network Systems, working with the local telephone company, demonstrated that ISDN was the solution. Their information services manager explained: "ISDN gave us the best capabilities for the least cost. And we didn't have to trash our existing systems."

With central office-based ISDN, ordinary phone lines become the links in a fully interactive network. This translates into many applications and benefits. Voice and data can be transmitted simultaneously. For example, students and professors can confer with the Dean, who has on-line access to student records. Electronic mail streamlines internal communication, so course enrollment changes can be posted immediately. PC/terminal access to host computers and electronic file transfer extend every user's access to sophisticated software and multiple databases.

As the college's IS manager puts it: "ISDN can revolutionize the education experience. It's going to make us a better college. And, bottom line, a more competitive college."



The Future's on the Line.

This college is just beginning to tap ISDN's potential. At AT&T, we believe this potential goes beyond today's need for improved communications to pave the way to a larger vision—Universal Information Services—a world of services on demand.

For more information, call the AT&T Futureline, 1-800-638-7978, ext. 0319

© 1988 AT&T



AT&T

The right choice.

Legislators urge regulation of 'junk' facsimile mail

By Bob Brown
Senior Writer

HARTFORD, Conn. — Legislators in at least three states have filed bills to regulate or ban the practice of distributing advertisements via facsimile machines, labeling the practice more of a nuisance than junk mail.

Legislators in Oregon, Washington and Connecticut have proposed bills to halt the increased flow of ads sent via facsimile machines.

Unsolicited facsimiles tie up users' machines when crucial messages could be sent or received, and they pin facsimile recipients with the cost of facsimile paper (about 10 cents a sheet) required to receive messages.

Options for regulating unsolicited ads distributed by facsimile include an outright ban, limitations on the time during which they can be sent or restrictions on facsimile machines that automati-

cally dial other facsimile machines for major distributions.

Oregon's Joint Interim Task Force on Telecommunications submitted a bill to the state's House of Representatives that said "No person shall use a machine . . . to transmit unsolicited advertising material for the sale of any realty, goods or services."

If approved, the legislation would allow Oregon's attorney general or county district attorneys to investigate violators. The court could also order offenders to pay restitution to victims or the victims could file a civil suit for damages, whichever is greater.

Connecticut is pondering similar penalties in legislation filed in January by State Rep. Richard Tulisano (D-Conn.).

Alternative legislative approaches being considered by Connecticut include encouraging self-regulation on the part of telemarketers, many of which al-

ready keep lists of people who do not wish to be contacted by direct mail firms, according to Kevin McCarthy, a research analyst at Connecticut's Joint Committee on Legislative Management's Office of Legislative Research.

A spokeswoman for Oregon's Senate Committee on Telecommunications and Consumer Affairs said the facsimile bill, which will have its first hearing tomorrow, is a proactive measure. The Senate has not yet heard many complaints from facsimile users regarding unwanted messages, she said.

Industry observers said some of the largest offenders are vendors of facsimile-related products, such as paper.

Bernie Thiel, director of public communications for the Association for Systems Management in Cleveland, said he has been subjected to a regular flow of unwanted press releases from assorted public relations firms since his organization purchased a facsimile machine last year.

"It's not a big problem, but I could see how it might get worse," Thiel said. □

Speakers want MFJ loosened

continued from page 9

partment of Justice recommending removal of the business restrictions, predicts that the restrictions will remain for some time but they may gradually be modified.

"I would guess in the next [triennial review], we will see some very serious scrutiny on the restrictions on manufacturing CPE, but the restriction on inter-LATA service is going to be here awhile," Huber said. "I would be surprised if Congress is able to pull together the consensus it will take to change" the restrictions.

According to Huber, even if Greene retired, it is unlikely the restrictions would be lifted. "This decree, despite Judge Greene's very personal involvement in it, transcends the individual here, and I think any other judge in that court would continue to enforce and apply it along similar lines."

William Ferguson, vice-chairman of Nynex Corp., said he fa-

vors legislation lifting the Consent Decree restrictions; however, he said, the RBHCs worry about the type of bill Congress might put forth.

"Yes, I favor legislation if the bill is relatively clean," he said. "If the bill looks like a Christmas tree with everything hung on it, from labor relations to whatever, then I think the bill would not be something we could support."

William McGowan, chairman and founder of MCI Communications Corp., always an outspoken supporter of competition in the telecommunications marketplace, criticized the RBHCs' attempts to free themselves from the restrictions. The Bell companies all agreed to the decree and said they thought it was fair, but six weeks later, they started opposing the restrictions, he said.

"If the Bell operating companies want to divest themselves of their local telephone monopoly, they're certainly welcome to compete with us, but not while they have the local telephone monopoly," he said. □

American, Delta set to link nets

continued from page 9

Oklahoma — the site of SABRE's massive network hub.

Top management of the new company and its governing board will be divided evenly between American and Delta. Cal Rader, Delta's assistant vice-president of automation, will become chief executive officer of the new venture. Kathy Misumas, president of SABRE Travel Information Network at American, will serve as president and chief operating officer.

Sitting on the board will be Robert Crandall, chairman and CEO of American; Ronald Allen, chairman and CEO of Delta; Max Hopper, senior vice-president of information services at American; Michael Gunn, American's senior vice-president of marketing; Hollis Harris, Delta's president; and Whit Hawkins, Delta's senior vice-president of marketing. Three outside directors will also be named. □

Justice Dept. examines Nynex arm

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The Department of Justice is conducting a grand jury investigation into allegations that Nynex Corp.'s Telco Research Corp. subsidiary violated the Consent Decree.

Sources at the Justice Department acknowledged the investigation but refused to reveal the names of the companies involved in the probe. Published reports, however, tie the investigation to Telco Research.

The department began looking into Nynex's activities in 1987 after Scott Rafferty, a telecommunications consultant for Telco Research in Nashville, filed a complaint with the Justice Department alleging Consent Decree violations. According to reports, this informal inquiry later grew into the grand jury investigation.

Grand jury investigations are used to determine whether there is enough evidence for a criminal indictment. Although such probes are a necessary first step before the Justice Department can bring a case to trial, they do not necessarily indicate that the department is seeking an indictment. The Justice Department sometimes uses grand juries to investigate cases without actually seeking an indictment.

Aubrey Harwell, an attorney with the Nashville law firm Neal & Harwell, confirmed that Telco Research's activities are being investigated by the grand jury, but he declined to specify the clients he is representing in the case. A spokesman for Nynex said Harwell is representing only clients from Telco Research.

In addition to the Justice Department complaint, Rafferty filed a civil lawsuit against Nynex in 1987 in the U.S. District Court for the District of Columbia alleging that he was wrongfully discharged after inquiring whether Telco Research's activities violat-

ed provisions of the decree.

As part of that lawsuit, Rafferty filed a letter earlier this month in which Nynex admitted to the Department of Justice that some of Telco Research's activities violated the Consent Decree.

The 1987 letter became public earlier this month after a court of appeals overturned a ruling barring the document from public disclosure. The letter by Gerald Murray, general solicitor for Nynex, was a response to questions from Nancy Garrison, assistant chief of the communications and finance section of the Justice Department's Antitrust Division.

Although Murray acknowledged that some of Telco Research's activities appeared to have been in violation, he said Nynex had stopped all of the questionable activities.

Specifically, Nynex said it had failed to comply with provisions requiring education of manage-

Murray said several of the apparent violations occurred due to misunderstandings.

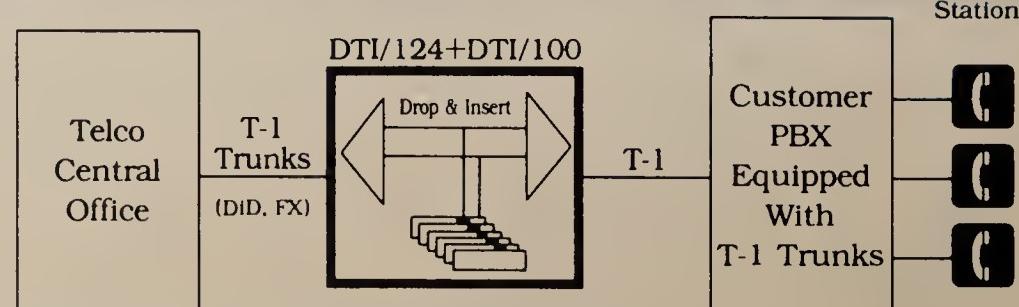


ment employees on the Modified Final Judgment, had allowed MCI Communications Corp. to access and use network design software running on a Telco Research computer, had failed to discontinue a tariff data base service run by Telco Research after Nynex acquired it and had engaged in consulting services beyond those allowed by the decree.

Murray said several of the apparent violations occurred due to misunderstandings or a lack of information on the part of Telco Research's management after the acquisition. In the future, Murray said, Nynex will communicate better with the management of acquired companies regarding Modified Final Judgment requirements and will obtain written notice that the companies have discontinued any activities that conflict with the decree. □

VOICE SOLUTIONS

APPLICATION: Voice Processing CPE Gateway



- D/40B - 4-line voice card
- D/41B - voice + call progress
- DTI/124 - T-1 interface card
- DTI/100 - PCM expansion card
- MF/40 - multifrequency card
- AMX/81 - audio multiplexer
- VR/10 - voice response card
- DID/40 - DID interface

PROBLEM:

Design a voice processing gateway to a CPE switch. Provide voice prompting, auto-attendant, and voice messaging. Make it T-1 compatible, reliable, low-cost. And finish it in months, not years.

SOLUTION:

Voice building blocks from Dialogic. Start with our D/4xB voice cards and DTI/T-1 cards in a PC-AT chassis. Use our MS-DOS or UNIX device drivers, development tools, and diagnostics. Spec in our 125,000 hour MTBF and our 18-month warranty. Profit from our low cost. And finish the system **fast!**

Field-proven engineering excellence from Dialogic. The *de facto* industry standard — over 100,000 lines installed!

For more information, call us at (201) 334-8450.

DIALOGIC CORPORATION

Headquarters: 129 Littleton Road, Parsippany, NJ 07054 / Regional Offices: Atlanta, GA • Austin, TX • Santa Clara, CA

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

"Rolm [Systems Division] PBX users have been put through two major shocks in the last 17 months. First they were hit with forklift upgrades for the CBX 8000 and 9000, and then IBM sold Rolm to Siemens. There are a large number of users out there that have egg on their face."

Richard Kuehn
President
RAK Associates
A Cleveland-based consulting and research firm

Carrier Watch

GTE Cellular Communications Corp. is providing credit card-activated mobile telephones to The Hertz Corp. as part of a pilot program to determine customer acceptance and demand.

Hertz is using the telephones in four rental markets: Oklahoma City, Dallas, St. Louis, Mo., and Hartford, Conn. The credit card telephones are operated by sliding a Mastercard, Visa or American Express card through a card reader and dialing the telephone number.

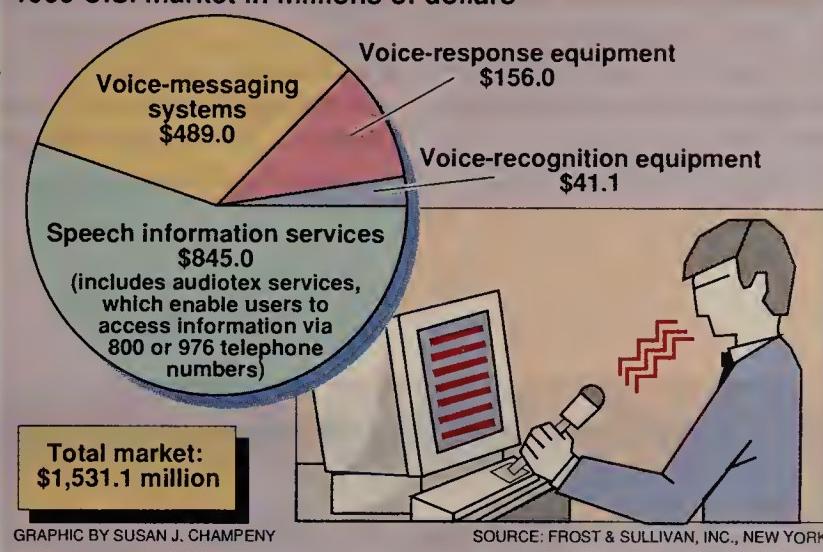
Speed-dial numbers for Hertz car reservations, airlines, hotels and restaurants are preprogrammed into the telephones. Hertz Emergency Road Service and the 911 emergency phone numbers can be called free of charge.

ITT Communications Services, Inc., the long-distance unit of ITT Corp., last week said it will add four new cities to its WATS network, effective next week. Businesses in Birmingham, Ala., Tampa, Fla., and San Jose and Santa Rosa, Calif., will now have access to ITT's family of Custom WATS services.

ITT Custom WATS services include ITT Custom WATS 200, 300 and 400. □

Speech processing is the talk of the town

1988 U.S. market in millions of dollars



GRAPHIC BY SUSAN J. CHAMPEY

SOURCE: FROST & SULLIVAN, INC., NEW YORK

Southern Bell withdraws controversial rate scheme

Carrier cans plan to freeze some rates in return for potential profits in face of tough opposition.

By Paul Desmond
Staff Writer

ATLANTA — Southern Bell Telephone and Telegraph Co. recently withdrew its controversial proposal to freeze rates on some services in exchange for potentially higher profits.

The plan, submitted to the Georgia Public Service Commission (PSC) last December, called for Southern Bell to fix residential and single-line business rates, and share with customers half of all profits above the carrier's approved 15% rate of return, said William Buckner, executive secretary of the Georgia PSC.

Proposal opponents, including the International Communications Association (ICA), feared the carrier was trying to deregulate business services.

Brian Moir, Washington, D.C. counsel to the ICA, said the association filed a petition against the proposal because it would let the carrier reap huge profits on business services, even though it would have to return half the profits to ratepayers.

The 15% return on revenue that Southern Bell enjoys in Georgia is the highest allowed by any PSC in the nation, he said.

Cas Robinson, a Georgia PSC commissioner and chairman of its Telecommunications Committee, said Southern Bell's plan would not have required the PSC to relinquish its control over tariffs for the carrier's business services.

"Georgia is a very pro-business state, and this commission is a very pro-business commission," he said. "This commission would not do anything that is going to be detrimental to the conduct of business in Georgia."

In a petition filed jointly by

the ICA and the Consumer Federation of America (CFA) that was delivered to the Georgia PSC on Feb. 3, the groups recommended that the Georgia PSC either reject the proposal outright, initiate a full rate-of-return review for the first time in three years or proceed with hearings on the matter.

On Feb. 7, following an administrative session, the commission decided on the latter suggestion but opted for truncated hearings, which would cut the usual process from six months down to 30 to 60 days, Buckner said. The commission's Telecommunications Committee met Feb. 9 to start that process.

But Southern Bell surprised the committee by announcing it was withdrawing the plan. Gene Parker, operations manager for public relations with the carrier, said last week that the proposal was withdrawn because the Telecommunications Committee decided to recommend that the full PSC hold hearings on the concept of incentive-sharing plans but not on Southern Bell's proposal specifically. Robinson said, however, that the recommendation was made after Southern Bell had withdrawn its proposal.

In addition to the joint ICA/CFA petition, the Georgia Consumer Utility Council, the Georgia Hospital Association, AT&T and MCI Communications Corp. filed petitions in opposition to the proposal, Buckner said. Local media also opposed the plan, which was labeled "dangerous nonsense" in an *Atlanta Constitution* editorial on Feb. 6.

The ICA last month issued a white paper urging regulatory officials to reject most local telephone company requests for de-

(continued on page 15)

AT&T's unified PBX eases upgrade strain

Definity replacement for System 75/85 could force Northern Tel, others to revamp switches.

By Bob Wallace
Senior Editor

AT&T's recent introduction of a single, expandable, private branch exchange product line will force arch rival Northern Telecom, Inc. and other switch vendors to unify their PBX lines to keep pace, according to industry analysts.

AT&T gained the edge when it unveiled the Definity 75/85 Communications System at the recent Communication Networks Conference and Exposition '89 show. The Definity marries the capabilities of AT&T's mid-range System 75 with its top-of-the-line System 85 PBX.

Definity is available in two models: the Generic 1, which can be configured to support from 100 to 1,600 lines, and the Generic 2, which can support as many as 30,000 lines. Both employ a distributed architecture with central control, AT&T said.

The Generic 1 and Generic 2 can be integrated with existing System 75s and System 85s in Electronic Tandem Networks, which are private networks that

support call routing, management and control functions.

AT&T System 75 users can retain 80% to 90% of their switch equipment, including circuit packs, cabinets and telephones, when they upgrade to a Definity 2. However, they must replace the System 75's Intel Corp. 80286 microprocessor-based processor with one based on AT&T's 501CC processor and swap out the PBX software with Generic 2, which costs \$35,000.

In the past, a user with a System 75 operating at full capacity had to replace the switch with a System 85. Now, without major hardware changes, customers can grow a System 75 from 100 lines (the minimum capacity) into a full-blown Definity Generic 2 supporting up to 30,000 lines.

"AT&T now has more than just talk; they have products," said Paris Burstyn, telecommunications research and consulting director for Technical Data International, formerly Business Research Group, a Boston-based consulting and research firm.

(continued on page 15)

WASHINGTON UPDATE

BY ANITA TAFF

US West seeks to pass SS7 info across LATAs.

US West, Inc. last week asked U.S. District Court Judge Harold Greene for permission to transmit Signaling System 7 (SS7) network control information across local access and transport area boundaries. With SS7, the signaling information needed to establish circuits and route calls is carried on a separate network from the net that is used to carry the actual calls.

Regional Bell holding companies are required to pass calls off to long-distance carriers through an interface in each LATA because they are barred by the Consent Decree from carrying calls and signaling data across LATA boundaries.

US West asked Greene to establish signaling interface points to long-distance carriers in only six of its 27 LATAs. The company argued that carrying SS7 signaling information across LATA boundaries does not violate Consent Decree prohibitions because user communications are not involved. The user's call will continue to be delivered to the long-distance carrier via the current interfaces in each LATA, US West said.

In a similar case that may determine how US West's request is treated, Greene, who oversees the decree, recently ruled that Bell Atlantic Corp. would have to put a computer in every LATA in which it provides information gateway services.

Bell Atlantic had asked for permission to maintain a central computer in Philadelphia for user account and data base location information that could be accessed across LATA boundaries. Bell Atlantic argued that transmitting billing information across LATA boundaries does not violate the decree since the call itself would be initiated and passed on to the data base provider through a local connection. □

AT&T offers management wares for Definity switch

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — AT&T unveiled a raft of switch management products at the recent Communication Networks Conference and Exposition '89 here, including a number of system management and call detail acquisition products. The software tools, unveiled along with the Definity 75/85 Communications System, enable users to manage, monitor and administer the new private branch exchange.

Definity combines the capabilities of AT&T's mid-range System 75 switch and its high-end System 85. The switch is available in two models: the Generic 1, which can support from 100 to 1,600 lines, and the Generic 2, which can support as many as 30,000 lines.

The products include:

- **Definity Manager I**, a system management tool for the Generic 1 that is identical to the existing System 75 System Access Terminal. It enables users to access switch-based administrative programs to perform station moves, adds and changes, and it can be used to produce management reports that detail alarms, traffic by trunk group and the use of attendant consoles. The product is included in the price of the PBX.
- **Definity Manager II** is a basic switch administration application for AT&T and other MS-DOS-based personal computers that provides a new user-friendly interface, English language field descriptions and on-line help for the Definity Generic 2, Dimension 600, Dimension 2000 and all versions of the System 85. The software is expected to be available in October for \$2,000.
- **Definity Manager III**, which builds on Definity Manager II by adding an Informix data base for reports, scheduling and modeling, lets users extract performance data from the Definity Generic 2's data base. This data can be structured into 30 different types of management reports.

The software runs on an AT&T 6386E Work Group System (WGS) or 3B2 600, and it has a feature that lets up to three people manage the switch simultaneously. It is expected to be available in April 1990 for \$10,000.

■ **Definity Manager IV**, a modular version of AT&T's Centralized System Management offering, consists of two modules: one supporting facilities management and a second for terminal change management. Definity Manager IV enables customers to use the same user interface when managing the System 85 (Release 2, Versions 2, 3 and 4), Dimension Feature Package 8 and Definity Generic 2 PBXs.

Definity Manager IV runs on a 3B2 600 and is expected to be available in the second quarter of

1990. Pricing will vary depending on the number of lines supported. Software supporting 5,000 lines will cost about \$45,000. Software supporting 10,000 lines will cost \$70,000, and software supporting more

than 10,000 lines will cost \$95,000.

■ **Definity Monitor I** is a new traffic application that can be used alone or with Definity Managers III and IV. It enables customers to monitor the trunk groups of Generic 1 or Generic 2. The software for an AT&T 6386 WGS will cost \$10,000, and it will \$15,000 for a 3B2 600. Both packages are expected to be available in July.

AT&T also unveiled three tele-management products that let businesses gather call traffic data that can be used to charge departments for telephone usage:

- **3B2 Call Detail Recording Utility (CDRU) Release 4.0** runs on AT&T 3B2 310 and 3B2 400 processors and can be used to poll and record calls from a Definity Generic 1 and Generic 2, as well as System 75, System 85 and Dimension PBXs. A new RS-232

interface enables the product to support other vendors' PBXs.

The 3B2 CDRU Release 4.0 stores between 400,000 and 1.7 million call records. The software is expected to be available in September for \$6,500.

- **Call Detail Recording Unit/Small** is designed for smaller switches and can store as many as 6,000 18-word records. The unit works with the Generic 1 and Generic 2, as well as System 25, Sys-



tem 75 and System 85 PBXs. The software is expected to be available in September for \$2,600.

■ Call Detail Record Poller (CDRP) Release 1.0 software runs on a 3B2 computer. It can support as many as 128 locations and simultaneously poll seven different locations. Call detail records can be sent to a tape or to a host computer. CDRP Release 1.0 will be available in September for \$16,000. □

AT&T's PBX eases upgrade strain

continued from page 13

In the past, System 75 users that outgrew the switch were looking at the System 85 and other vendors' high-end PBXs, according to Burstyn. "With Definity, AT&T is looking to lock up its installed base."

A second analyst said Definity gives AT&T an edge over its toughest competitor, Northern

Telecom. "AT&T now has more product continuity in its PBX line than Northern has in its," said Ian Angus, president of Angus TeleManagement Group, Inc., a research and consulting firm based in Pickering, Ontario.

Angus pointed out that moving from Northern Telecom's Meridian SL-1 PBX to the larger Me-

ridian SL-100 is akin to moving from an AT&T System 75 to a System 85. "The switches are completely different, the software is different and even the telephone sets are different," he said.

The upper limit of the Northern Telecom SL-1 is about 5,000 lines, according to Angus. Customers that want to expand their systems must step up to the SL-100, which can handle as many as 30,000 lines.

"The big problem for Northern Telecom has been customers that have between 3,000 and 6,000 lines," Angus said. "They're at the high end of the SL-1 but are small enough that they think an SL-100 is overkill." This group includes many of the nation's high-profile users, including government agencies and large corporations, he added.

Angus and other analysts say they expect Northern Telecom to ease the transition from the SL-1 to the SL-100. "I expect Northern [Telecom] to announce some general means of protecting the investment of users that move to the SL-100."

Last year, Bernie Mayoux, SL-100 product marketing manager for Northern Telecom, said the vendor was readying a smaller, less expensive SL-100 capable of handling 3,000 to 8,000 lines ("NTI readies downsized SL-100 PBX," NW, May 2, 1988).

"At some point in time, they will have to make a decision to truly unify their [PBX and central office switch] product lines, and users will view this as a big plus," said Patrick Springer, industry services consulting director for Computer Task Group/Telecommunications Management Corp., a Needham Heights, Mass.-based consulting firm.

Vendors that opt for a uniform PBX product line will be able to cut production costs, according to Angus. "And their dealings are going to be better with their dealers. In a market that's very price-sensitive, carrying one product line instead of two makes a big difference," he said.

This issue is of greater importance to Northern Telecom, which sells most of its PBXs through third parties, than to AT&T, which primarily sells directly to users. □

Southern Bell withdraws plan

continued from page 13

regulation because they are harmful to telecommunications users ("ICA urges caution in deregulatory efforts," NW, Jan. 30). The paper was included in the ICA/CFA petition, Moir said.

That paper warned against social contract agreements such as the one proposed by Southern Bell. Under such agreements, carriers offer to shield from price increases services that would become less expensive anyway.

Georgia Hospital Association's petition requested that the *Network World* story on the ICA paper be entered into the record as evidence against Southern Bell's proposal, said Robert Searfoss, director of education and telecommunications services for the group of 180 hospitals.

Parker said the concerns raised in the petitions were answered by Southern Bell and that the objections had nothing to do with the carrier's decision to withdraw its proposal. □

To Handle Tomorrow's High Data Speeds, Use Plenum Cable Insulated With Teflon® Today.

Soon, your system is going to run at higher data rates. But if your twisted pair cable isn't built for speed, you'll get bogged down with

"jitter"—
fluctuations in
timing of
network signals.
That can lead to
increased bit
error rate,

system slowdown, and cable obsolescence. Unless you install plenum cable made with TEFLO™ fluorocarbon resin.

In tests, cables insulated with TEFLO demonstrated superior

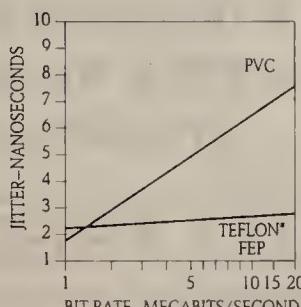
performance compared to PVC and other materials, because TEFLO dramatically reduces a cable's contribution to jitter. And that means reliable data transmission, whether you're running at 10 megabits today or 20 megabits

or more with your next generation system.

TEFLON also allows for longer cable runs, thanks to a dielectric constant of 2.1 —

the lowest of any insulation. Cable made with TEFLO also cuts installation costs by 50% because it meets building codes without conduit.

The bottom line is simple: Use cable insulation of TEFLO now, and you'll be ready to run at higher transmission speeds later. To learn more, write for our free brochure on twisted pair cable for high-speed networks: Du Pont Company, 595 Colonial Park Drive, Roswell, GA 30075.



Jitter contribution of 24-gauge twisted pair cables with 6 to 7 mils of insulation.



REG. U.S. PAT. & T. OFF.

INDUSTRY KNOWLEDGE HAS NEVER BEFORE BEEN SO EASY TO GET

BROADCAST LIVE VIA SATELLITE TO YOUR OFFICE

PAY PER VIEW SEMINARS:

SELLING TECHNOLOGY SOLUTIONS
MIKE BOSWORTH
FEBRUARY 22, 1989

IBM MIDRANGE STRATEGIES
DALE KUTNICK MARC BUTLEIN
MARCH 3, 1989

NETWORKS IN THE NINETIES
LEONARD KLEINROCK
FEBRUARY 24, 1989

AUTOMATED NETWORK MANAGEMENT II:
THE TECHNOLOGY
JAMES HERMAN
March 17, 1989

All Pay Per View Seminars are purchased separately; program time: 11:30am - 4:00pm, ET

A CONTINUING SERIES FOR SENIOR MANAGERS:

"COMPETING IN TIME: WINNERS AND LOSERS IN THE ELECTRONIC MARKETPLACE"

Featuring Peter Keen, author of the Business Best Seller, "Competing in Time" and Executive Director of The International Center for Information Technologies (ICIT), a subsidiary of MCI.

GUESTS INCLUDE:

- Bill McGowan, MCI
- Bill Howard, Bechtel
- Paul Berger, STM
- Eric Wilner and others

SITE LICENSE: \$6,750

- All six monthly programs
- Unlimited audience size
- FREE KU-BAND RECEIVING SYSTEM (installation extra)

AUDIENCE:

The Computer Channel's Senior management series was designed to update, inform, and stimulate the CEO, senior officers, and line managers as they develop corporate business strategies around information technology. The series is suited for all information management professionals challenged with developing and implementing technology-based business strategies.

ORDER BY 2/28/89 GET FREE KU-BAND SATELLITE RECEIVING SYSTEM

ALL PROGRAMS 11:30AM - 1:30PM ET

February 27, 1989

May 31, 1989.

"Senior Management Awareness
and Vision"

"The New IS Professional"

March 15, 1989

June 21, 1989

"What Senior Management Must
Know About Emerging
Technologies"

"Customer Research in the
Electronic Marketplace"

April 12, 1989

July 12, 1989

"Managerial Courage"

"Seeing the Seven Year Horizon"



The Computer Channel, Inc.
99 Tulip Avenue
Floral Park, NY 11001

FOR ADDITIONAL INFORMATION, PLEASE CALL (516) 352-9490

DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

"AT&T's [Unified Network Management Architecture] is going to be very successful. The Accumaster product set is an off-the-shelf integration device that's not only meant for AT&T. It looks like it may pull things together pretty well."

Frank Dzubeck
President and CEO
Communications Network Architects, Inc.
Washington, D.C.

Data Packets

Computer Network Technology Corp. (CNT), based in Minneapolis, recently announced two new models of its LANLord 8000 Interprocessor Gateway series. The new models support high-speed Transmission Control Protocol/Internet Protocol nets in both IBM and Digital Equipment Corp. environments.

The IBM channel-attached Model 8100 routes IP traffic between IBM MVS mainframes and high-bandwidth transport media, including CNT's own 50M bit/sec local net trunks and multiple T-1 or Ethernet nets. The 8100 interfaces with IBM MVS-based hosts via Advanced Computer Communications Access/MVS software.

The new Model 8200 supports The Wollongong Group, Inc.'s WIN/TCP for VMS communications software, enabling the 8200 to act as an intelligent front end for DEC VAX computers on TCP/IP networks. The combination of hardware and software lets DEC and non-DEC host users transfer files, log on to remote computers, send and receive electronic mail, and use communications programs.

The new products are designed to provide high-speed links between various vendors' hosts and workstations. (continued on page 19)

GE tools pave way for EDI transmission of CAD data

Design*Express line targets manufacturing firms.

By Paul Desmond
Staff Writer

ROCKVILLE, Md. — GE Information Services recently unveiled a line of products to address the electronic data interchange (EDI) needs of the manufacturing and engineering industries.

Design*Express lets engineering and manufacturing companies use EDI to transmit graphics-based design and manufacturing product data, including programming files that drive automated machine tools.

The data transmission and processing options of Design*Express provide the means for any computer-aided design and manufacturing data, including images, to be transmitted through GE Information Service's EDI network, said John Schmarr, product marketing manager for the products.

The first of the three Design*Express products is the Design*

Express System, an EDI service supported by GE Information Service's existing EDI*Express public network but tailored to accommodate various CAD/CAM formats and to provide translations between them.

Part of that customization is a data authentication feature that performs a bit check with an accuracy rate of 10⁻²² on every document transmitted, Schmarr said.

GE Information Services is also serving up Design*PC, a software package for IBM Personal Computers that acts as the administrative front end of the EDI network by establishing trading relationships with other users and performing security procedures, Schmarr said. Optional encryption/decryption software is also available.

The final offering, Design*Display, is optional software that lets a personal computer generate and display CAD/CAM data. (continued on page 19)

DATA DIALOGUE

BY IRA BRODSKY

Fast dial-up modems are wave of the future

Most data communications professionals have been so busy trying to get up to speed on local networks, LU 6.2 and T-1 multiplexing, they have barely noticed the revolution under way in dial-up modem technology.

International standards, such as V.32, have evolved defining full-duplex, synchronous and asynchronous dial-up operation at link rates up to 9.6K bit/sec. Dial-up modems themselves are becoming more reliable and less expensive. By such techniques as asymmetrical operations — running at different speeds in opposite directions — they can offer four-wire performance over two-wire lines.

Third-party vendors are busily developing hardware and software to take advantage of these enhancements. Together, these changes allow the data communications network manager to configure national, and even international, data networks that rely primarily on public switched service.

One of the more interesting changes involving high-speed, dial-up modems involves net control and management. At first glance, it might seem that dial-up communications defies the kind of control that is widely available for hierarchical, host-based, leased-line nets. For example, leased-line nets can poll remote on-line devices at will, but with dial-up data communications, the remote device generally initiates each session. If the remote device fails, the host may never be alerted.

But a new type of centralized, dial-up data network is emerging. These networks run in "broadcast mode." Software on minicomputers or personal computers automatically dials out to remote devices during off-peak hours, and multiple ports on hosts plow through long dial-up lists at the same time.

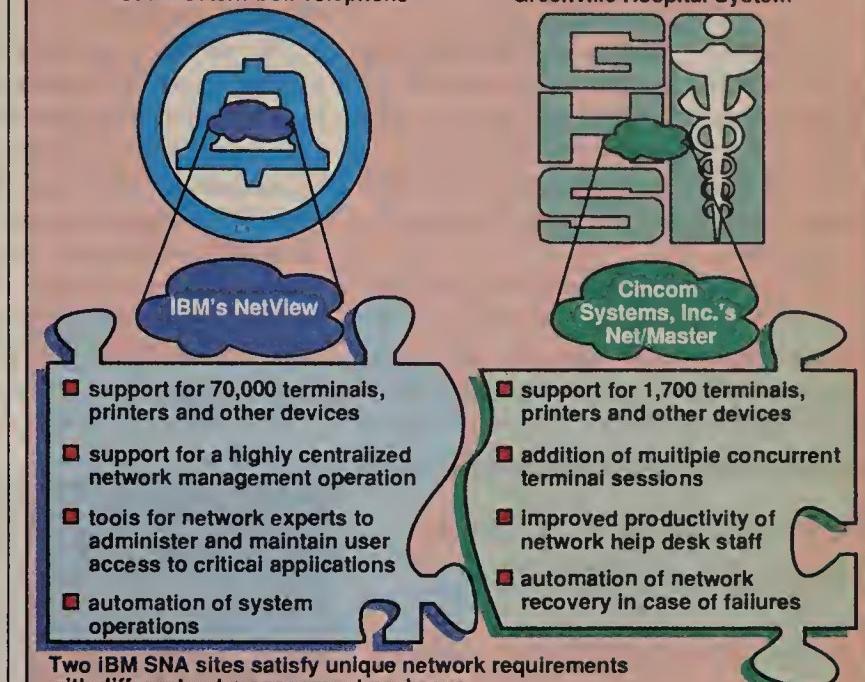
Redialing, adapting to noisy line conditions, verifying receipt (continued on page 19)

Brodsky is director of product marketing for U.S. Robotics, Inc. in Skokie, Ill.

Pieces of two net management puzzles

Southwestern Bell Telephone

Greenville Hospital System



SOURCES: SOUTHWESTERN BELL TELEPHONE CO., ST. LOUIS, AND GREENVILLE HOSPITAL SYSTEM, GREENVILLE, S.C.

Net control factors dictate purchases

By John Cox
Senior Editor

WASHINGTON, D.C. — Users of two rival Systems Network Architecture net management products say the choice of which to buy depends as much on network requirements as on product features.

"Two questions users should ask are: 'What do you want to do with [net management]?' and 'How much do you want to spend?'" said Doug Weber, district manager of the information systems department at Southwestern Bell Telephone Co., based in St. Louis.

Weber, whose company uses IBM's NetView, spoke here at the recent Communication Networks Conference and Exposition '89. Joining him was Jerry Madden, senior network analyst for the information services division of the Greenville Hospital System in Greenville, S.C. The hospital holding company had been a NetView user but jumped to Net/Master, an alternative from Cincom Systems, Inc., based in Cincinnati. The two men described SNA nets designed to meet different business requirements, although both nets offered an integrated SNA management scheme.

NetView and Net/Master are host-based programs that use the IBM VTAM program. Both programs can be used to monitor and control networks, performing functions such as monitoring terminal sessions and data traffic patterns, and collecting hardware alerts. The most recent releases of both products offer improvements that let users automate network operations.

In five states, Southwestern Bell has eight data centers outfitted with IBM and Unisys Corp. mainframes as well as a network of some 70,000 terminals and other devices. The net supports midsize file transfers and a battery of interactive applications. The company originally managed the network using several programs that were integrated into NetView in May 1986.

Greenville Hospital's much smaller network serves 11 facilities supporting a variety of IBM processors and about 1,700 terminals and other devices. The network serves medical users, who use it 24 hours a day, and administrative personnel, who process patient accounts and demand minimal downtime and short response times.

Both net managers said their particular network needs determined the value of each product's various features. One example of how the users' needs differed is in the unique role of the help desk in each company.

At Southwestern Bell, the help desk is a hot line that handles some 30,000 problems per month, most of them minor. More serious problems, such as those concerning access to applications, are referred to highly skilled hardware and software support staff, Weber said.

Since the help desk plays a minor role in managing serious network problems, this capability was not a major selection criteria when Southwestern Bell went shopping for an integrated network management system.

Instead, the company put a (continued on page 18)

Mitek bolsters server to link IBM mid-range with Ethernet LANs

By John Cox
Senior Editor

CARROLLTON, Texas — Mitek Systems Corp. recently released an improved Ethernet server for creating a two-way link between IBM mid-range processors on Systems Network Architecture networks and other vendors' computers on Ethernet local networks.

The new OpenConnect Server Model M2030-256 supports as many as 256 concurrent sessions between the two nets, compared with 64 sessions with Mitek's earlier model. Further, the new product's

price, \$39,500, is only 15% higher than the previous model.

The new server also inaugurates a new product name. The term "OpenConnect" is designed to emphasize Mitek's goal of supporting both international and industry standards. This support lets IBM and non-IBM computers communicate over IEEE 802.3 Ethernets running Transmission Control Protocol/Internet Protocol network protocols, according to Don Anselmo, president of Mitek, which is based here.

The Mitek server attaches to an Ether-

net on one side and to an IBM communications channel on the other. The server supports the IBM mid-range processors — the System/36, System/38 and Application System/400 — running under MVS, VM and VSE. In addition, a range of different vendors' computers can be attached to the Ethernet.

To users on the Ethernet, the Mitek server is simply another Ethernet node. To the IBM hosts, the server appears as either a PU 2 or 2.1 device, the latter being a unit that can communicate on a peer-to-peer basis with IBM controllers, Anselmo said.

Via the server, users in either environment can do bidirectional logon and file transfer, perform full-screen editing and use IBM's TN3270, an implementation of TCP/IP's Telnet virtual terminal protocol. The server supports various terminal emu-

lations, all designed to create transparent access for end users, Anselmo said.

A 3270 user can emulate a DEC VT-220 terminal to access programs on a VAX. Or the DEC user can emulate an IBM 3270 device to run programs on the IBM host.

Mitek's connection products such as the OpenConnect Server typically are used in multivendor environments by customers that want an alternative to directly connecting workstations or minicomputers to hosts, or that want to interconnect Ethernet-based local nets over an SNA backbone. This backbone link eliminates the added costs of creating a bridge-based link and takes advantage of SNA's sophisticated security measures, Anselmo said.

Mitek is located at 2033 Chennault Drive, Suite 100, Carrollton, Texas 75006; or call (214) 490-4090. □

Net control factors dictate purchases

continued from page 17

premium on being able to continue to use such sophisticated tools as a session monitor, which provides software support staff with details about terminal sessions and use of mainframe applications.

By contrast, the help desk is a key element in Greenville Hospital's net management approach. Madden said NetView's complexities repeatedly flummoxed help desk staffers, slowing down their response to network problems.

Further, Greenville Hospital's executive management decreed three new network requirements: security implemented at the network level to control systems access, the ability to support multiple terminal sessions from a single terminal and automated logons to multiple applications so that users could hot-key among them.

Company management wanted multiple session support in software, not hardware, because the latter soaks up processing power and requires frequent laborious rewriting of communications controller programs, Madden said. Multiple sessions via software eliminate these drawbacks. But NetView did not have this capability.

The Cincom product did; and for this reason, it drew Madden's attention. He eventually concluded that Net/Master's ability to support multiple concurrent sessions, automated logon and its extensive on-line help screens would benefit the help desk.

"We were able to make the nontechnical desk people more productive in network management," he said. "They don't have to rely on technical network people, which frees [the technicians] to be productive in their own environments."

Southwestern Bell's Weber was well aware in 1986 that the Cincom product had a number of features the IBM software lacked. "But those functions were either met by other [specialized third-party] products in our environment or were not really applicable to us," he said.

Consequently, Southwestern Bell concluded that Net/Master could add little to what was available with NetView. However, NetView enabled the company to continue with an IBM product that integrated the familiar management programs already in use.

"If it ever appears Net/Master would have an overwhelming advantage in our environment, then we would consider alternatives [to NetView]," he said. "But the emphasis would have to be on 'overwhelming.' In a company our size, such a conversion is definitely not trivial." □

**Three words
that throw
fear into the
hearts of our
competitors:**

Fast dial-up modems wave of the future

continued from page 17

of files and generating activity reports, are all features found in broadcast mode communications software.

One example of the use of dial-up broadcast mode is Research Triangle Institute's (RTI) nationwide network. RTI is a nonprofit organization located in Research Triangle Park near Raleigh, N.C., that coordinates clinical trials for the treatment for acquired immunodeficiency syndrome (AIDS) on behalf of the National Institutes of Health.

Dick Paddock, senior research programmer analyst at RTI, estimates that dial-up lines save RTI more than 25% over leased-lines.

"The savings realized by going with a high-speed, dial-up network made the difference," Paddock says. "We considered dedicated lines, but they were simply cost-prohibitive."

While dial-up data transmission now offers significant benefits in cost, performance and availability, one area in which the dial-up world still lags behind the dedicated-line world is network management.

How can network management be applied to dial-up data communications? Some people may scoff at the idea of testing dial-up connections. Such connections are transient, and there is a low probability of getting the same circuit if one dials the same number twice.

Measuring and recording connection parameters, and calculating averages can provide useful information, especially if

connections that fall below certain levels of quality can be traced. Local-loop problems are often particularly difficult to isolate. However, the local loop is a constant in circuit-switched connections so regular measurements can be used to highlight suspicious loops.

Other companies may want to gather aggregate statistics on the performance of their long-distance carriers. Again, while no two connections to the same destination may be identical, an average measure of the long-distance carrier's data transmission quality can be telling.

As the dial-up data communications revolution continues, we can expect to see more powerful techniques for automating date transfers, testing resources and compressing and ensuring the integrity of data over dial-up lines. □

GE tools pave way for EDI transmission

continued from page 17

Using the ADAPT machine tool programming language, the software creates parts programs and display files that adhere to popular CAD/CAM formats, including the Initial Graphics Exchange Specification.

Although it was designed for CAD/CAM applications because of the heavy demand for EDI in the engineering and manufacturing fields, Schmarr said the Design*Express line is not limited to those applications. "Since it can handle any type of data, it can be used for more than just CAD/CAM," he said. "We have requests for use in the medical environment as well as in the apparel and footwear arena."

Customers access Design*Express System using lines ranging in speed from 9.6K to 56K bit/sec.

The Design*Express System carries a transaction-based price that is dependent on commitment level, plus document processing and send/receive fees. Design*PC software is priced at \$1,250, and the encryption/decryption option costs \$1,000. Design*Display workstation software costs \$5,500.

For more information, contact GE Information Services at 401 N. Washington St., Rockville, Md. 20850, or call (800) 334-5669. □

A network is a complex system.

When buying one, it's important to evaluate the network as an integrated unit, because a network is more than the sum of its parts.

Capacity your overall network can handle, to be sure your network doesn't run out of gas during peak loads.

REROUTE RACE. Record how long it takes to switch a call through another route when

node knockout. Plug back in to see if and when the node gets back up.

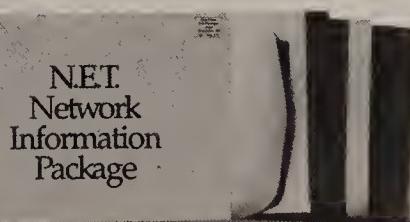
PACK THE NET. Verify the amount of bandwidth a trunk provides and the entire network delivers for user traffic. Efficient bandwidth usage is key to rapid payback.

The toughest test of all: Reality.

N.E.T. T1 and T3 networks are proven at the most demanding organizations, including the most critical national security applications. Seven of the top ten diversified financial companies. Nearly half of the top 80 MIS/DP installations. And major international organizations with global networks.

Call for your free N.E.T. Information Kit today.

Find out how our clients are winning. And how a private network can help you gain a competitive advantage.



Information Hotline:
1-800-952-6300.
Ask for dept. N13

Network acid test.

You'll want to put it through drills that show how nodes and other equipment integrate, interact and perform as a system.

We at N.E.T.™ love a network acid test.

Because it gives us the opportunity to show you superior performance and maximum communications advantage — proof positive.

Put our network to the test.

Watch us shine through the most stringent drills in the industry.

CAPACITY CHECK. Verify the number of trunks and ports a node supports, and the ca-

a connection is broken, and even more important, how long it takes to reroute multiple calls (can the network handle multiple reroutings simultaneously?).

MANAGEABILITY ACID TEST. Give network management tools a workout to see how easy they are to use, and how much control they offer. Add a node site to the network to see how complicated and time consuming an addition will be.

NODE KNOCKDOWN/KNOCKOUT. Pull different cards, shelves, and other components to see how nodes adjust to a knockdown. Pull the plug on a node to see how the network handles a

Our clients are winning.™

NETWORK
EQUIPMENT TECHNOLOGIES™

800 Saginaw Drive, Redwood City, CA 94063. (415) 366-4400, TLX 172325

Data Packets

continued from page 17

The two new gateways both have a base price of \$25,000. Host software is priced separately according to configuration.

CNT is located at 9440 Science Center Drive, Minneapolis, Minn. 55428, or call (612) 535-8111. □

Digital Microwave Corp. recently announced new additions to its family of digital radio products, which are typically used in short-haul, point-to-point transmission of digitized voice, data and video information.

The new DMC 23LC is a 23-GHz digital radio that features an integrated multiplexer supporting four DS-1 lines for a total capacity of 96 pulse code modulation voice channels. The new radio also supports DMC Net, the company's network management system. The DMC 23LC costs \$26,000.

Digital Microwave also announced a new low-end addition to its M Series radio family. The new DMC 18M model supports as many as four DS-1 lines. Previous models supported eight or 16 lines. The products allow users to meet the need for additional capacity incrementally. Prices range from \$31,450 to \$41,750, depending on line configuration.

The company also announced the DMS Forward Error Correction Enhancement Option for its W Series radio line. The new option, a board that slots into the radio, increases a radio's system gain (the increase in signaling power that can occur during transmission) by four decibels, according to the announcement.

By also providing continuous performance and bit-error rate monitoring, the new option eliminates the need for external test equipment and telemetry to monitor link performance, according to the announcement. The price of the enhancement board is \$2,700.

Digital Microwave is located at 170 Rose Orchard Way, San Jose, Calif. 95134, or call (408) 943-0777. □



Bruce Sobolov, Director,
Equipment Planning and Administration,
Election & Survey Unit, CBS News

Laura Gismondi,
Account Executive,
AT&T Data Systems Group

Bruce Goldberg,
Area Technical Manager,
AT&T Data Systems Group



Bruce Sobolov of CBS News, Laura Gismondi and Bruce Goldberg, AT&T, savor the afterglow of their own post-election victory. They take us behind the scenes for a glimpse at some of the reasons why CBS was successful on election night.

FEBRUARY 15, 1989

AT&T: Afterwards, the critics said CBS was the best, the fastest.

CBS: Right, but we sweated it out for more than a year. With more 20-hour days than I care to remember.

AT&T: Your situation was pretty complicated.

CBS: We were faced with election projections, exit-poll analysis, and other studio programming applications running on IBM hosts.

AT&T: Plus the NewStar system we tied in with our wide-area network, ISN. It's distributed networked computing. Hey, we thrive on this stuff.

CBS: We're impatient around here. Speed is the only way you succeed with election coverage. The first thing we did was provide multi-host access with the 6500 System. Last election, everybody who needed access to two systems used two terminals. Twice the space, twice the cable, additional controllers, added expense, and wasted time.

We had programmers working simultaneously on three host applications, two bisync, one SDLC. They were constantly skating between terminals, wearing ruts in the rug. Now they have access to multiple sessions simultaneously from one terminal.

AT&T: The data moves over twisted pair, the same type wiring the technicians pulled for your System 75 PBX. That made sense.

CBS: An added advantage was having the same dedicated AT&T technicians installing and maintaining our system, providing consistency to my operation.

AT&T: But really, Bruce, why us?

CBS: Your responsiveness. At

Skating between terminals put ruts in the rug.

CBS, we all agreed that what we needed was someone who could deliver it fast, install it, test it, and support it. And you were hungry. You never said, "No, we can't do it." And you never took long to say "yes."

AT&T: You had computer networking problems. Solving them is the house specialty.

CBS: We do distributed computing to the nth degree. Our reporters are all over the country. They call in their results when the precinct closes. Before, we had over a hundred operators standing by, with phones and terminals. That election night we introduced the voice response system running on AT&T PCs.

AT&T: How many calls?

CBS: Thirty, thirty-two calls at once, reporters everywhere having voice response conversations with the IBM host. And all done with the same

custom host software we always used. We greatly reduced our cost.

AT&T: The other networks are watching, thinking, "How come CBS has the results already and we don't?"

CBS: It was a good night for us. Now the name of the game is streamlining for 1990. We're talking about a networked computer solution as a gateway into different host systems.

AT&T: With the AT&T Systems already up, running, and in place, we can almost completely automate your survey system.

CBS: That's a real big plus for all of us.

AT&T: Something tells me I've seen that same glint in your eye before. (Laughter)

The CBS Solution:

THE CHALLENGE:

Integrate IBM and DEC host computers and NewStar editorial system. Build an advanced computerized voice response system to speed election-night projections.

THE SOLUTION:

AT&T 6500 Multifunction Communication System with multi-host sync/async 6529 terminals. AT&T CONVERSANT® Voice System for advanced communications running on AT&T WGS computers. AT&T System 75 PBX. AT&T Information Systems Network (ISN), a wide-area network.

THE RESULT:

CBS News provided fast, accurate election coverage throughout Campaign '88. The *Baltimore Sun* reported that, "CBS was recording results in all sorts of key races faster and with far more authority than either of the other networks."

Call your AT&T Account Executive, Reseller or 1 800 247-1212, Ext. 154.

IBM is a registered trademark of International Business Machines Corp. DEC is a registered trademark of Digital Equipment Corp. NewStar is a registered trademark of Dynatech Corp. ©1989 AT&T

your computing systems and networking solutions company

 **AT&T**
The right choice.

DAVID ExpressNet. What we left out



Tail fins are functional on fish and airplanes but never added much utility to automobiles or local area networks.

you'll never miss.

We left a lot out of DAVID ExpressNet twisted pair LAN.

Stuff like non-standard approaches. Added modules. Extra Software. Complexity. Unnecessary bulk. And high price. The tail fins of networking.

What we left in will light up your Ethernet network. A high speed hub that will serve 12 stations and conform to the 10Mb IEEE 802.3 standard. PC- or terminal-based on-board

diagnostics and network management features that deliver detailed on-screen reports of network status and traffic. And it all runs effortlessly on affordable twisted pair cabling that is easy to install and maintain.

Compact, functional DAVID ExpressNet—the best value in twisted pair networking. Plus the better service and proven technical capability of DAVID Systems and its resellers.

Keep tail fins on airplanes and fish—call DAVID Systems today for the location of a DAVID reseller in your area. **408/720-8000.**



DAVID Systems

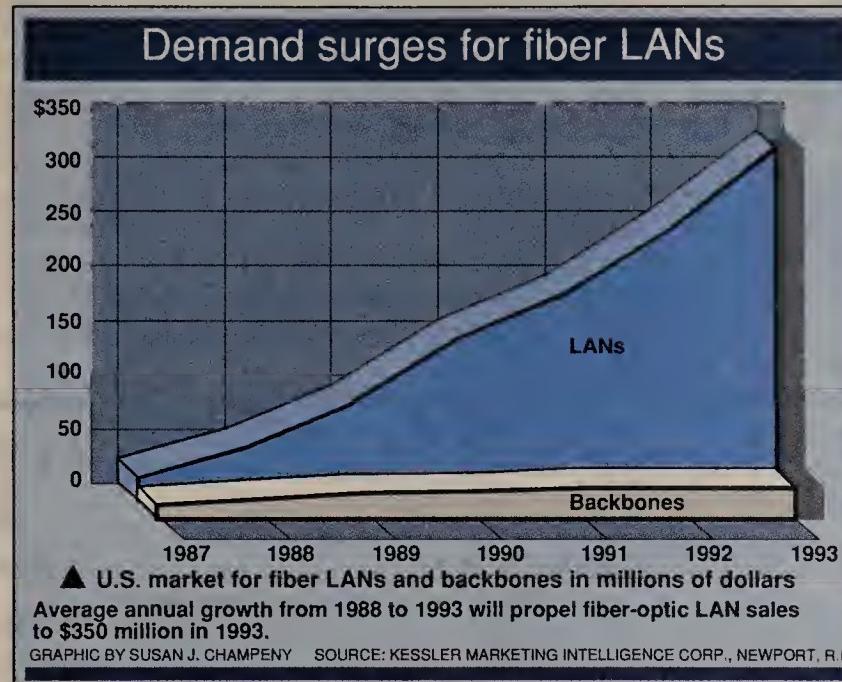
701 E. Evelyn Ave.
Sunnyvale, CA 94086

LOCAL NETWORKING

PC AND TERMINAL-TO-HOST LANS, GATEWAYS AND MICRO COMMUNICATIONS PRODUCTS

Worth Noting

A survey of 100 executives who have personal computer local nets installed in their businesses revealed that 67% of the local networks support users in multiple departments. The report, called "PC LAN Buying Patterns," was prepared by Business Research Group in Boston.



Kinetics upgrades gateway by adding DECnet support

FastPath 4 lets Macs appear as DECnet nodes.

By Laura DiDio
Senior Editor

NEW YORK — Kinetics, Inc. recently announced that its FastPath 4 Apple Computer, Inc. LocalTalk-to-Ethernet gateway now supports Digital Equipment Corp.'s DECnet routing protocols.

The FastPath gateway enhancements enable Macintosh users on Apple LocalTalk nets to exchange files, electronic mail and print services with nodes on a DECnet network, according to Tom Cromelin, Kinetics marketing manager.

"The FastPath 4 gateway lets Macs on LocalTalk nets appear as if they are DECnet nodes," Cromelin said. The FastPath 4 maintains all of the DECnet routing tables necessary for Macintosh users to communicate with DECnet users on Ethernets, he added.

Prior to this, only Macintosh users on Ethernets could use Alisa Systems, Inc.'s TSSnet software to communicate with DECnet nodes, Cromelin said.

The FastPath 4 gateway, introduced last July, is a stand-alone device that lets users connect 230K bit/sec LocalTalk networks to 10M bit/sec Ethernets. The DECnet protocol enhancements to the FastPath 4 gateway were unveiled here at the recent DEXPO East '89 trade show. The gateway software is used in conjunction with the latest version of Alisa Systems' Macintosh application software, TSSnet v1.3.2.

Alisa Systems' TSSnet software provides all the terminal emulation and file transfer capabilities necessary for the Macintosh to act as a peer on a DECnet network, according to Robert Denny, president of Alisa Systems.

"Previously, only Macintosh-

es directly connected to Ethernets could use the TSSnet software to access DECnet nodes," Cromelin said.

However, that method is more expensive than the FastPath 4 gateway because users have to purchase separate Ethernet controller cards for each of their Macintosh systems, Cromelin said. Kinetics' Ethernet controller cards cost \$695 each.

Using the FastPath 4 gateway, users can connect as many as 30 Macintoshes on a LocalTalk network through Ethernet to any host system running the DECnet protocols for just \$2,795, Cromelin said.

In addition to AppleTalk and DECnet, the FastPath 4 gateway supports Transmission Control Protocol/Internet Protocol.



In addition to the AppleTalk and DECnet protocols, the FastPath 4 gateway also supports the Transmission Control Protocol/Internet Protocol and AppleTalk network protocols.

DECnet routing support will be bundled with every FastPath 4 gateway beginning in March. Current FastPath users will receive the DECnet gateway software upgrade free of charge. The FastPath 4 gateway costs \$2,795. Alisa Systems' TSSnet v1.3.2 DECnet software costs \$495 per Macintosh. □

DCA packages wide, local network lines

Firm's turnkey integrated network push intended to alleviate user hassle of systems integration.

By Laura DiDio
Senior Editor

ALPHARETTA, Ga. — Digital Communications Associates, Inc.'s Network Communications Group (NCG) is now bundling its wide-area network products with the company's local net line as part of a push to offer turnkey integrated networks.

The company also has announced support for the Transmission Control Protocol/Internet Protocol in a package called 10-NET TCP.

Integrating DCA's 10Net Communications Division's local network products with NCG's wide-area offerings saves customers the task of merging the local- and wide-area net products.

Beta users of the turnkey packages lauded the move, saying the integrated offerings provide a single source for service. The move also helps DCA better compete against 3Com Corp. and Digital Equipment Corp., which market themselves as one-stop network shops.

"We're responding to user demand for a complete and integrated solution," said Mark McWilliams, an NCG senior product market manager. "Nearly all of our wide-area network users also need local networks."

The NCG unit will bundle DCA's local net products with its own Series 300 network processor, which performs routing, multiplexing and protocol conversion; LanGate, a software package that works with TCP/IP software to access Ethernet local nets; and LanServer, a server that connects as many as 16 terminals to a DCA Series 300 via Ethernet.

Those devices can be custom-integrated with products from the company's 10Net subsidiary, including the 10-NET 10 MEG Fiber Optic LAN and Hub; the 10-NET LAN for Ethernet and the newly announced 10-NET TCP/TCP/IP software package.

The products will be marketed as the LanPC product line under DCA's LanNet family. Customers (continued on page 24)

IBM declines membership in token-ring association

By John Cox
Senior Editor

WASHINGTON, D.C. — IBM recently declined an invitation to join the Open Token Foundation (OTF), a vendor group that is promoting interoperability among token-ring products.

John McElroy, IBM's local-area network product manager at Research Triangle Park in Raleigh, N.C., said IBM will not join the trade group at this time, even though the computer maker agrees with OTF's goal.

"Our intention is to make the Token-Ring as interoperable as possible and really expand its market," McElroy said.

However, in a separate press statement, IBM said OTF appears to be promoting the standardization of details for products that attach to a token-ring network, for example, the attachment of IBM Personal Computers to a token ring, development of network adapter cards specifically for IBM's Token-Ring Network and other hardware interfaces.

"IBM does not support this objective," the statement said. "Freezing the design and specifi-

cations for internal components is likely to impede innovation and severely constrain evolutionary improvements in token-ring technology."

Robert Madge, president of Madge Networks, Ltd. and one of the founders of OTF, denied IBM's charges.

"We're not trying to freeze designs or create a standard," Madge said.

IBM's decision not to join the organization is disappointing but not totally unexpected, Madge said.

The computer maker's absence may make it more difficult for third parties to develop products that interoperate with the IBM Token-Ring Network, but work will proceed, Madge said.

OTF was jointly founded two months ago by 3Com Corp. of Santa Clara, Calif., and Madge Networks of London ("Network makers team up in token-ring association," NW, Dec. 5, 1988).

The goal of OTF is to create token-ring products that not only comply with industry standards but also interoperate with one another. □

Netnotes

Virtual Microsystems, Inc. recently added two new Intel Corp. 80386-based models to its V-Server line of DOS application servers for Digital Equipment Corp. VAX nets.

The V-Server products are self-contained systems with between two and eight 80286-based, board-level microcomputers that can each run off-the-shelf DOS applications.

The master CPU in the new V-Server386 is built around an 80386 microprocessor, which improves response time.

The V-Server386/Plus lists for \$17,500, and the V-Server386 costs \$15,500.

Virtual Microsystems can be contacted at 1825 S. Grant St., Suite 700, San Mateo, Calif. 94402, or call (415) 573-9596.

Sytek, Inc. is enhancing its LocalNet Integrated Network Connectivity (LINC) series of multiple-protocol software with a product that will support the new Open Link Interface (OLI) specification recently announced by Novell, Inc. and Apple Computer, Inc.

LINC/PAK-OLI is a hardware and software combination that includes a copy of Novell's NetWare as well as a copy of Sytek's LINC/PC Multiple Protocol Driver software and three Sytek Ethernet adapters.

LINC/PAK-OLI is priced at \$3,995.

Sytek can be contacted at 1225 Charleston Road, Mountain View, Calif. 94043, or call (415) 966-7300. □

DCA packages wide, local network lines

continued from page 23

can buy any combination of the wide- and local-area net products from DCA, using the wide-area net products to bridge the local networks.

DCA disclosed its plans to offer integrated wide- and local-area net packages at the Communication Networks Conference and Exposition '89.

"Our intent is to offer local network users a migration path to DCA's LanNet family of wide-area network products and provide compatibility between all 10Net and DCA products," said Ken Davis, senior product manager for NCG.

LanNet is a family of wide- and local-area network integration products that let users access Ethernets across a wide-area

network through gateways and servers. DCA began melding the 10Net and NCG lines last summer.

Users purchasing integrated local- and wide-area nets from NCG will pay a premium. "We're not going to sell the bundled 10Net local net products at a discount," McWilliams said. On a per-item basis, the 10Net products could cost about 5% more than the unbundled local net products sold by DCA's Personal Computer Communications Group, he said.

"We're providing users with added value as an integrated, single-source vendor. Normally, when a user buys wide- and local-area net products from separate vendors, they must bear the responsibility for

marrying the two technologies," McWilliams said.

Lockheed Engineering & Sciences Co., a Beltsville, Md., subsidiary of Lockheed Corp., has been beta-testing a DCA local- and wide-area network.

Lockheed, a longtime 10Net user, has been testing an integrated package of DCA's Series 300 wide-area network nodal processor, Irma microcomputer-to-mainframe boards and 10Net local nets for the past month.

"We like the idea of buying both LAN and WAN products from one vendor," said Bill Szyperski, a systems and network analyst at Lockheed.

"DCA is offering us better support than we could expect to get from several vendors," he said, "and there's no finger-pointing if something goes wrong."

Embracing TCP

One of the first 10Net products marketed under the DCA name is 10-NET TCP, a new TCP/IP optional software package for 10Net networks.

Previously, 10Net only supported IBM's Network Basic I/O System protocol to tap into IBM networks. The TCP/IP support will let 10Net users access Unix-based nets and other sites supporting TCP/IP.

"What we've done is allow 10Net users to connect to the rest of the industry," said Arnie Lapinig, 10Net's vice-president of marketing. 10-NET TCP software resides on a personal computer, enabling 10Net users on 10M bit/sec Ethernets to connect to DCA wide-area networks by using the company's Series 300 nodal processor.

10-NET TCP supports TCP/IP applications for file transfer, terminal emulation and electronic mail. It also supports all NETBIOS applications via an additional software component, 10-NET TCP NET-BIOS.

"This component extends the reach of the network. Although they're using TCP/IP as the transport protocol, users can access all NETBIOS applications on the network," Lapinig said.

Lockheed is also a beta-test site for 10-NET TCP and has been using the new software on its DCA wide-area network. "It's

worked well for us. We've used the TCP/IP software in conjunction with Telenet [Communications Corp.] services to establish LAN/WAN communications," Szyperski said.

10-NET TCP will be sold as a software option to run with 10Net's 10M bit/sec Ethernet. The software can reside on any MS-DOS-based personal computer on the network equipped with a 10Net network interface card, enabling it to communicate with TCP/IP nodes.

Besides the ability to connect to other TCP/IP network environments and DCA wide-area networks, the new 10-NET TCP

DCA is offering us better support than we could expect to get from several vendors, and there's no finger-pointing if something goes wrong," said Lockheed's Bill Szyperski.



Increase Your Networking Knowledge

April 3-6, 1989
Boston, Massachusetts

June 19-22, 1989
Dallas, Texas

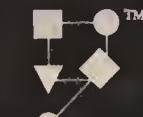
TCP/IP OSI/ISO and ISDN Internetworking Tutorials

- Dr. Comer's In-Depth Introduction to TCP/IP
- Berkeley UNIX® Networking
- TCP/IP for the VM Systems Programmer
- ◆ Local Area Networks and TCP/IP Alternatives
- ◀ Message Handling Systems and Directory Services - X.400/X.500
- The Domain Name System
- Network Management of TCP/IP-based Internets
- ▶ Network Operations and Security Issues
- ◆ Bridges and Routers
- Practical Perspectives on OSI Networking
- ◀ Integrated Services Digital Networks (Boston Only)

Call Today!

In addition to the tutorial schedule you will receive a complimentary issue of the industry newsletter, *Connexions-The Interoperability Report*.

For complete tutorial details, contact:
Advanced Computing Environments
480 San Antonio Road, Suite 100
Mountain View, CA 94040
415/941-3399, Ext. 14

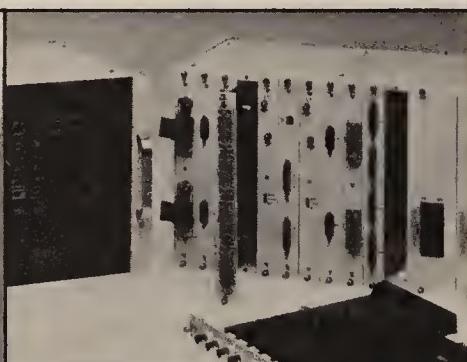


Shared Fiber Links for Both LANs and Leftovers!

Your LAN traffic isn't the only data that has to go places, is it? You have other communications problems to solve, too. The real problem is how to merge all of them into one cost-effective, contemporary solution.

MAGNUM from Fibermux is the only high-capacity fiber-optic backbone that can merge Ethernet bridging and Token Ring expansion from two to nine sites or more *together with* any mix of other electrical interfaces—TODAY. You can get your LANs linked on the same fiber that carries data from your IBM 3X74 control units to remote 3270s at channel speeds!

Magnum's Ethernet interface provides simple bridging between segments up to 30 km apart with no practical data transfer rate reduction. Its Token Ring support links nine separate 802.5 rings



together using only one-eighth of the backbone's total capacity. The best news? Magnum is part of a broad selection of related signal distribution products that support

any building or campus cabling strategy you might be planning.

To clinch the deal, Magnum provides support for single or multimode fiber, options for back-up power supplies and common elements, on-line network management, and easy growth. Merging LAN traffic?

Call and compare our solutions.



FIBERMUX
CORPORATION

9428 Eton Ave., Chatsworth, CA 91311
Phone: (818) 709-3856 Telex: 988350
Fax: (818) 709-1556

Copyright © 1988, Fibermux Corporation. All rights reserved.
IBM is a trademark of International Business Machines Corporation.

ANIXTER
STOCKS
digital's
DECconnect™
Communications System

The DECconnect Communication System encompasses the full family of Digital products from network electronics to cabling and connections. DECconnect supports access to corporate computer networks, telephone communications, and a video network. The modular nature of DECconnect allows for the mixing and matching of components to meet user specific requirements.

For more information contact:
U.S.A. — 1-800-826-9708
CANADA — 416-897-5665
UK — 011-44-1-568-1681
EUROPE — 011-32-3-457-3570

ANIXTER
Wiring Systems Specialists

Voice • Video • Data • Power
CORPORATE HEADQUARTERS: Anixter Bros., Inc.
4711 Golf Rd., Skokie, IL 60076

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Worth Noting

Nearly 15% of the respondents in a survey of approximately 1,100 managers at U.S. companies said they will use electronic data interchange to replace telex, facsimile or electronic mail services. The survey was prepared by Oak Park, Ill.-based EDI Research, Inc.

Association Watch

The Northwest chapter of the Tele-Communications Association, Inc. (TCA) is hosting a three-day conference March 8 to 10 in Seattle.

The conference will feature educational sessions on a variety of topics including career advancement, network management, local networks and Integrated Services Digital Networks.

Among expected speakers is Nancy Abraham, director of information services for the state of Washington. Also speaking are vendor representatives from US West, Inc., AT&T and IBM.

TCA's legal counsels, Michael Senkowksi and Jeff Linder, will also discuss access tariffs filed by US West.

For more information, contact TCA Northwest Chapter headquarters at (206) 237-3496.

A call for papers

The TCA has also issued a call for papers to compete for a \$1,000 prize that will be given at its Annual Conference in San Diego beginning Sept. 25.

The papers are due by April 28. They should focus on one or more of the following topics: communications design techniques, training and education, network applications for problem areas, strategic planning, regulatory issues and new technologies.

For more information, contact TCA headquarters at (818) 967-9411. □

MANAGEMENT PROFILE

BY WAYNE ECKERSON

Global net offers bank int'l edge

SAN FRANCISCO — While many U.S. businesses have prospered in the 1980s, BankAmerica Corp. has struggled just to survive.

Delinquent loans to third-world nations and increasing competition in the financial services sector almost buried California's largest bank. In 1985, BankAmerica halted its stock dividends. Two years later, it posted staggering year-end losses of \$1 billion.

In late 1986, the bank had to stave off a hostile takeover attempt by rival First Interstate Bancorp.

Since BankAmerica wasn't ready to cash in its hand, it instituted a series of cost-cutting measures and other reforms. Through it all, the company's worldwide voice and data network has played a key role in helping the bank reduce costs and buoy revenues.

BankAmerica's cost-cutting and network strategy, both domestically and abroad, has paid off. The bank posted record earnings of \$265 million in the last



BankAmerica's world headquarters in San Francisco

quarter of 1988 and recently announced it would reinstate its quarterly dividend payments.

Also, the bank now boasts a worldwide international banking network that only Citicorp, Chase Manhattan Bank, N.A. and Barclays Bank plc in London can match, according to analysts.

The turnaround

On the verge of dissolution, BankAmerica moved swiftly to cut costs and scale back its worldwide operations. Since 1986, the bank has laid off 30,000 employees, replaced virtually all members of its top management, ex-

(continued on page 26)

INDUSTRY BRIEFS

BY BARTON CROCKETT

The true price of travel. U.S. managers have a love/hate relationship with business travel, according to a report released late last year by Chicago-based Hyatt Hotels Corp.

For some people, business travel is stressful, straining family relationships and cutting productivity. But for others, travel can be a source of pride and power. Many think it is a vital part of career advancement, according to the report, titled "The Hyatt Travel Futures Project."

How you view travel depends on the type of person you are. The study documents four types of travelers.

Least prevalent, or 9% of the 601 people surveyed, are Eagles — people who have been taking business trips for only a few years. Eagles enjoy travel despite reporting a high degree of stress. Next, at 10% of the sample, are Tightrope Walkers, women under 35 who feel powerful on the road but also more harried and tense than most travelers. Twenty percent of the sample are Family Ties — married travelers who say travel puts stress on their spouses. The most common group, or 31% of the sample, are Road Warriors. These people travel a great deal and claim they can be on the road an average of 7.6 days before a trip interferes with their personal lives, twice the average reported by all survey respondents.

The average survey respondent was 41 years old, has been a business traveler for nearly 12 years and takes 30 overnight trips per year. □

ICA members work on int'l net puzzle

Seminar-goers discuss the problems of building nets to handle business in new global economy.

By Barton Crockett
Senior Editor

ARLINGTON, Va. — As a growing number of U.S. businesses expand abroad, more and more communications managers face the onerous task of building international networks, according to attendees at the International Communications Association's (ICA) Winter Seminar held here recently.

U.S. companies' involvement in foreign ventures has increased dramatically in recent years due to the globalization of the economy, users at the conference said.

According to the U.S. Congress' Office of Technology Assessment, exports accounted for only 6% of the gross national product (GNP) in 1970, while 8% of the GNP was spent on imports. In the third quarter of 1987, exports were 11% of the GNP, and spending on imports rose to 15%.

The evolution of international trade is reflected in the networking efforts of ICA members. "More [ICA] members say they are looking at building international networks than ever before," said William Hegge, manager of telecommunications with Northwestern Mutual Life Insurance Co. and chair of the Winter Seminar committee.

Difficulties

Building and running these international networks can cause big headaches, users said.

One difficulty users face in running international networks is grappling with foreign regulations, which are typically more restrictive than those in the U.S.

Lack of adequate technology can also be a problem. Public networks in lesser developed countries, by Western standards, are often archaic, users said.

Different business norms add to the difficulties. In some countries, bribery is an accepted part of business. The temptation to offer or accept bribes can test the moral fiber of even the most upstanding communications manager.

"If you have ethics, you can forget it," said Phil Friedman, director of technology at Philip Morris Companies, Inc.'s international division. "Once I flew with a client to Latin America. He had a suitcase full of money he said was for 'gratuities.' Sure enough, we had an outbound 9.6 line in 30 days."

Despite these difficulties, us-

ers said they are forging ahead with international networking efforts. Some users said global networks give them a strategic edge. Such is the case with San Francisco-based BankAmerica Corp., which this year is cutting over high-bandwidth facilities linking data centers in Hong Kong and London with its domestic headquarters (see "Global net offers bank int'l edge," this page).

Other users said networks are a necessary part of doing business but one they would rather avoid.

"Our business is booming all over the world, and we need a flow of information to support it," Friedman said. "But this is very hard. Most of the cost structures in international [communications] are absurd."



Spliced phone lines between buildings in Buenos Aires

Friedman said his company runs networks in more than 50 countries. Doing so, he added, requires him to cater to capricious and costly demands from foreign carriers.

"We've paid more to put in a few modems in Latin America than to run a T-1 line from New York to Richmond [Va.]," he said.

Latin America

Latin America, several ICA members said, ranks with several developing Asian countries among the most hostile environments for networking.

"You can have power outages that last two, three, sometimes four months," said H.L. Bobson, senior communications engineer with the Miami office of Pan American World Airways, Inc.

Slow service from carriers often compels companies in cities

(continued on page 26)

ICA works on int'l net puzzle

continued from page 25

such as Buenos Aires, Argentina, to splice telephone lines and run them over busy streets between buildings in order to get a connection to the public net (see photo on page 25).

Bobson said his company gives line testers, lightning protection devices, backup power systems and other technologies to carriers in Latin America to support the airline's reservation and flight control networks there. "Sometimes we act more like a supplier than a customer," he said.

But running networks even in developed countries can also be a headache.

Ikuo Ohashi, counselor, telecommunications for the Embassy of Japan in Washington, D.C., said that in his country users are typically not allowed to switch traffic from private networks to public nets, which is allowed in the U.S.

Jochen Schlegel, counselor of posts and telecommunications for the Embassy of West Germany, said that even with proposed liberalization in his country, users still will not be allowed to bypass public networks with voice traffic. □

Global net offers bank int'l edge

continued from page 25

ited from international retail banking and sold off several major assets.

The company's new management stepped in and used the existing communications infrastructure for BankAmerica's world banking group to transform its international data processing system into an efficient, cost-competitive operation.

In the early 1980s, while other users were touting the value of distributed processing, the bank's world group consolidated its far-flung DP systems into global data centers in London, Los Angeles and Hong Kong. This move sharply reduced the costs of maintaining separate data systems and staff at each branch.

The cost savings has allowed BankAmerica to keep its branch offices open at a time when many international banks have closed theirs. It also has enabled the world group to offer competitively priced wholesale services.

Moreover, BankAmerica's global net has made it possible for the world banking group to standardize the hardware and software applications that are used in every BankAmerica branch throughout the world.

The resulting common system

architecture enables the bank to offer new or enhanced services to all its branch offices more quickly. It also allows the bank to offer a series of powerful real-time global account management services and improve the accuracy with which the bank updates and records customer accounts.

"I don't imagine, in the lifetime of a major bank, you will again see a communications staff completely rewrite the entire banking system that runs an international division," said Marsha Lansman, general manager of the global banking system at BankAmerica.

Rebuilding Babylon

Lansman's staff members first revamped the bank's European region and largely finished the project in 1984.

They linked branch offices in nine European countries, Africa and the Middle East via leased lines and satellite links to a data center hub in Croyden, England, just outside of London.

The network now supports a wide range of wholesale banking services for U.S. and foreign multinationals, such as Siemens AG and McDonald's Corp.

Services include foreign ex-

change trading, account updates, electronic funds transfers, payments and credits. IBM mainframes in the data centers are capable of processing 20 million instructions per second. The network's response time is less than three seconds from any branch.

Lansman's team is now busy migrating BankAmerica's international banking system (IBS) to branches on other continents. Branches in Asian and Pacific Rim countries are being linked via leased lines to a data center in Hong Kong, while a data hub in Los Angeles is serving branches in Latin America. These two centers and the London center are tied via undersea leased lines and satellite links.

Stripping the DP functions from the branches and consolidating them in a central location have brought cost savings to the branches through greater economies of scale. Branches typically spend 25% less on processing data in the first year they are linked to IBS and 10% to 15% the second year, according to Ned Putnam, vice-president of global banking. These savings are usually passed along to the customer, thereby enabling the bank to offer competitive pricing, he said.

Moreover, branches can reduce labor costs because they no longer have to support a back of-

fice staff to run systems and other operations. Since 1986, BankAmerica has reduced its international labor force by about 400 people.

Not all industry observers are impressed with the changes BankAmerica has made. Barry Cohn, an analyst at Drexel Burnham Lambert, Inc. in New York, said BankAmerica is merely making the best of the bad situation left by previous management.

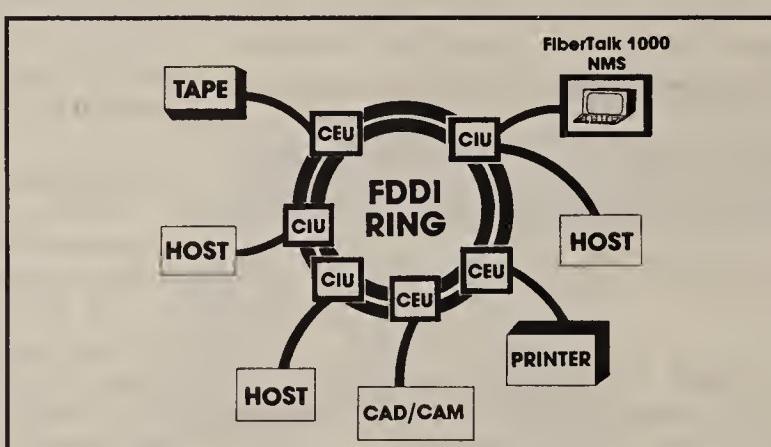
"The bank developed a Rolls Royce for a market that only needed a Volkswagen," Cohn said. "Having poured a ton of money into their global banking network, the bank is now trying to capitalize on its initial investment by creating new services."

Lansman said the standardized architecture allows the bank to market high-volume services.

Also, since the bank's three data centers use the same hardware and software to support international wholesale banking services, a new branch office can be brought on-line in only 12 weeks, Putnam said. Previously, this took six to nine months.

The common architecture system also improves BankAmerica's ability to record customer transaction data accurately because account updates are done by computer instead of by hand. □

How to make Metropolitan Area Networking a familiar ring around the office, and make you a hero.



By letting IN-NET's FiberTalk products put your present networking technology into the next generation of communications.

IN-NET products offer complete integration of VOICE, DATA, VIDEO and IMAGE transmission, increased connectivity, reduced long term installation cost, multiple or single site installation, connectivity to public or private networks and speeds of 34/45 Mbps or 100 Mbps. All operating on fiber.

IN-NET's existing and upcoming family of products include:

- **Channel Products** that provide connectivity between geographically isolated IBM mainframes and plug compatibles via a 100 Mbps FDDI fiber network.
- **Backbone Network Products** provide a bandwidth of 34/45 Mbps.
- **Network Extension Products** provide connectivity between the FDDI or the 34/45 Mbps networks.
- **The Network Manager** is a PC operating system that provides centralized management for maintaining, controlling and supervising the network.

For more information on how you become a hero and enhance your corporate network communications, simply give us a ring.



IN-NET CORP./16720 West Bernardo Drive/San Diego, CA 92127-1904/Phone (619) 487-3693/FAX (619) 487-3697

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

Worth Noting

See inside for:

- A version of AdaptsNA APPC software from NSA
- An FTP Software package that lets MS-DOS PCs run NFS
- Wang's Office/DISOSS Gateway software that supports SNADS

Cincom's Net/Master gets a boost

By Jim Brown
New Products Editor

CINCINNATI — Cincom Systems, Inc. recently announced a new version of its IBM mainframe-based Net/Master network management software that offers a number of enhancements, including expert system features.

The software, Net/Master Version 2.1, will make it easier for nonprogrammers to create routines that automatically identify and resolve system and network problems. The expert system software packages, dubbed Expert System Foundation (ESF) and Net/Stat, run on IBM mainframes and enable operators to build a knowledge base of information by filling in blanks on a series of screens. The knowledge base defines certain problems as well as the commands needed to resolve them.

Problem resolution

Current Net/Master customers have to use Cincom's fourth-generation Network Control Lan-

guage (NCL) to create routines for identifying and resolving problems.

ESF supports a rules-based process that obviates the need for NCL procedures when identifying or resolving system problems. "ESF gives operators the ability to go through a series of screens and fill in the blanks rather than writing procedural code," said Vicki Duckworth, senior product manager for Net/Master.

ESF works with Net/Master's Sys/Master module, which is used to manage IBM mainframe system operations. Messages concerning error conditions or information detailing the status of batch processing jobs is forwarded from system devices such as printers and disk drives to Sys/Master.

The messages are then passed on to ESF, which runs through if-then statements to figure out whether a problem needs to be resolved or whether a different task can be initiated.

The other expert-system software, Net/Stat, works with Net/Master's Advanced Network Management module, which acts as a central repository for alerts and alarms from devices in an IBM Systems Network Architecture network.

Net/Stat runs through a series (continued on page 29)

Data Switch adds to ChannelNet line

New channel extender supports up to four IBM mainframe channels over 45M bit/sec facilities.

By Jim Brown
New Products Editor

SHELTON, Conn. — Data Switch Corp. recently expanded its line of ChannelNet channel extenders with the introduction of a product that supports as many as four IBM mainframe channels over 45M bit/sec T-3 facilities.

The company also added T-1 multiplexer capability to its Distributed Switch Matrix (DSM) product line, which includes the 4,096-port Galaxy Plus matrix switch.

The company's ChannelNet 9455 ChannelPlexer consists of a four-port link adapter that provides the T-3 interface and supports four channel adapters. Users connect IBM mainframe block multiplexer channels to the adapters via bus and tag cables.

When one or more of the four attached channels is idle, the link adapter employs a statistical multiplexing technique to reassign unused time slots to active channels. When all four attached channels are active, the adapter uses speed conversion to accommodate the load.

The ChannelNet 9455 ChannelPlexer is controlled using System Controller software running on an IBM Personal Computer. The software monitors T-3 circuit conditions as well as hardware operation and error conditions.

A ChannelNet 9455 ChannelPlexer system supporting two host channels costs \$250,000. The system includes two channel adapters, one link adapter, an

IBM Personal Computer and System Controller software.

Data Switch added T-1 support to its DSM matrix switch line with the T-1 SwitchLink, a T-1 multiplexer that can be installed within a DSM cabinet.

The T-1 SwitchLink, which has digital access and cross-connect system (DACS) capability, can support 20 simultaneous T-1 links and has 28 slots that accept single-port T-1 interfaces and five-port V.35, RS-232 and X.21 interface boards. Each of the five-port boards can operate at up to 64K bit/sec. Another board supports three high-speed V.35 or RS-422 ports, each of which can operate at up to 1.544M bit/sec.

Although it shares a cabinet with the DSM switch, the T-1 SwitchLink works independently of the switch. Low-speed ports from the T-1 SwitchLink must be connected to ports on the matrix switch.

The integral DACS function enables the T-1 SwitchLink to switch DS0 channels from one T-1 line to another. This enables the T-1 SwitchLink to extract voice calls from multiple incoming T-1 lines and switch them to a private branch exchange via a single T-1 link while data calls are switched to matrix switch ports.

The cost of adding a T-1 SwitchLink supporting 20 T-1 circuits to a DSM switch is \$60,000.

Data Switch can be reached by writing to 1 Enterprise Drive, Shelton, Conn. 06484, or by calling (203) 926-1801. □

DG introduces Ethernet interface for Eclipse MV

WESTBOROUGH, Mass. — Data General Corp. recently introduced an Ethernet interface for its Eclipse MV minicomputer line and announced it will resell an Ethernet terminal controller.

Developed jointly by DG and 3Com Corp., TermController lets customers link Eclipse MV minicomputers to Ethernets running Xerox Corp.'s Xerox Network Systems transport protocol.

The board, which is compatible with DG's Data Channel and L-Bus buses, is the company's first Eclipse MV-to-Ethernet connection, according to Todd Kurland, DG's senior product manager for communications. The product works in conjunction with TermServer, a 3Com-developed terminal server that links as many as 10 asynchronous devices, such as terminals, personal computers and printers, to an Ethernet.

Any ASCII asynchronous terminal or printer supported by the Eclipse MV host can be connected to TermServer via RS-232 or RS-422 physical interfaces. Personal computers running DG's CEO Connection software, which enables the personal computer to emulate a DG Dasher terminal, can also be linked to TermServer.

DG sells two versions of TermController. The \$9,500 ITC/128 works with the Data Channel bus and supports a total of 128 sessions, 64 of which can be active. The \$5,300 LTC/64 works with the L-Bus and supports 64 sessions, 32 of which can be active. Users can establish multiple sessions but must keep inactive sessions in background mode.

DG also introduced its Intelligent Asynchronous Controller (IAC) board, which supports direct connection of eight or 24 asynchronous terminals to an Eclipse MV minicomputer. Residing in the Eclipse MV, the board is available with RS-232 or RS-422 interfaces and replaces an earlier version of the IAC, Kurland said.

The new IAC uses one or two Motorola Corp. 68000 microprocessors, depending on the model. This gives it 20% to 30% more processing power than existing IACs that use DG's own micro-Eclipse microprocessor.

An eight-port IAC costs between \$3,400 and \$3,900, depending on the number of microprocessors. The 24-port IAC costs between \$7,400 and \$7,900, also depending on the number of microprocessors. □

Vitalink offers new TransLAN

By Susan Breidenbach
West Coast Bureau Chief

FREMONT, Calif. — Vitalink Communications Corp. has expanded its TransLAN line of remote Ethernet bridges with the addition of a low-end model.

The TransLAN 320 supports one or two links to remote networks at speeds up to 64K bit/sec. The Ethernet bridge can be used with a mix of transmission options, including 56K bit/sec digital data service links, analog leased lines, switched 56K bit/sec services and 64K bit/sec Eu-

ropean services. As many as eight remote TransLAN 320 units can be linked to Vitalink's higher end TransLAN III or TransLAN 350 bridges, which both support T-1 1.544M bit/sec transmission speeds.

The TransLAN 320 is compatible with the company's WANmanager network management offering and Digital Equipment Corp.'s local LAN Bridge 100. It can also share wide-area links with Vitalink's TransRing token-ring bridges.

Like other TransLAN models, the TransLAN 320 features Vitalink's Spanning Tree Protocol and Distributed Load Sharing.

Network administrators can access the TransLAN 320 remotely using any network-attached asynchronous terminal. The TransLAN 320 has built-in net-

(continued on page 28)

First Look

continued from page 27

The goal of the service is to integrate information from various sources so users can receive all available information regarding a certain topic without accessing each information provider individually.

Pricing for DAISE includes a flat fixed fee of \$1.75 per month for each user, a per-minute fee ranging from 30 cents to \$1, depending on the service accessed, plus the local RBHC transport fee.

DataAmerica Corp., 8000 Towers Crescent, Suite 1000, Vienna, Va. 22180, or call (703) 761-7000.

mainframes, and perform remote tasks on multivendor computer systems.

NFS-compatible software for personal computers running PC/TCP is available for Ethernet, token-ring and Starlan nets.

The software is compatible with more than two dozen network interface cards from a range of manufacturers, including AT&T, BICC Data Networks, Inc., Digital Equipment Corp., Exce-

lan, Inc., IBM, Interlan, Inc., Proteon, Inc., 3Com Corp., Unger-mann-Bass, Inc. and Western Digital Corp.

The software is priced at \$230 per copy and will be available in April. Software that includes a full set of TCP/IP applications sells for \$500.

FTP Software, Inc., P.O. Box 150, Kendall Square Branch, Boston, Mass. 02142, or call (617) 868-4878.

cording to the company.

The SP 9000 supports from six to 12 ports, and the MP 9000 supports from 12 to 54 ports. The SP model has a maximum throughput of 240 packet/sec, while the MP can handle as many as 900 packet/sec.

The high-end **CX 2000** switch has a 32-bit architecture and supports throughput of 1,800 packet/sec. It can be expanded from two to 32 ports in two-port incre-

Memotec unwraps three new packet switches

Memotec Data, Inc.'s Data Communications Division recently introduced three new packet switches, ranging from a low-end model to a high-end communications node.

The **MP 9000** and **SP 9000** are designed for large private networks requiring high-capacity and mid-range performance, ac-



The networking T1 from the #1 name in network solutions.

Meet Omnimux® 8000. The newest addition to the most complete T1 product line in the industry...a range of solutions that covers everything from channel banks and DACS to the most sophisticated, multi-nodal, networking T1 muxes.

Built with over 30 years of networking knowledge, the mid-range 8000 puts our experience to work for you. To make T1 more like you'd like it to be. More affordable. More reliable. More manageable.

More affordable, because **modular architecture** lets you buy only the features you need. The result: a customized T1 solution just right for your network. And for your budget.



More reliable, because **redundant integral CSUs**—both primary and hot back-up spare for every T1 line—ensure maximum uptime. You don't waste time and money replacing CSUs. You won't lose your diagnostic database either. And you can tell the difference between T1 line and CSU problems faster and easier, too.

More manageable, because instead of the risk of a single point of failure, you get **single point control** of both CSUs and T1 muxes. One menu-driven, integral network management system gives you comprehensive tools to ensure maximum network availability.

Want more? How about bandwidth contention. Bypass, automatic alternate routing, and drop/insert. Versatile data and voice support. And still more. All at a price you're sure to like.

NSA unveils AdaptSNA APPC software package

Network Software Associates, Inc. recently announced a new version of its **AdaptSNA APPC** software that includes 12 new control verbs. The verbs provide personal computer users with more specific information about the status of Advanced Program-to-Program Communications and the physical link than was previously possible.

For example, when there is a communications breakdown, the verbs can determine whether a line was dropped, a request was received or a conversation ended. Before, APPC programming indicated only a "Resource Failure."

AdaptSNA APPC runs on IBM Personal Computers and compatibles, Personal System/2s and lap-top computers. It also enables microcomputers to communicate with other APPC applications, including host-based systems such as IBM's DISOSS.

The new version of AdaptSNA APPC is available for immediate delivery and costs \$285.

Network Software Associates, Inc., 22982 Mill Creek, Laguna Hills, Calif. 92653, or call (714) 768-4013.

FTP pack lets MS-DOS PCs support NFS

FTP Software, Inc. recently unveiled software that allows MS-DOS personal computers to support Sun Microsystems, Inc.'s Network File System (NFS). The as yet unnamed software enables personal computer users to access information and programs on workstations, minicomputers and mainframes that support NFS. It also allows users to store files and programs on remote disks.

The software works with FTP Software's PC/TCP package, an MS-DOS implementation of Transmission Control Protocol/Internet Protocol for local- and wide-area networks. PC/TCP allows personal computer users to transfer files, transmit electronic mail, access minicomputers and

ments and supports trunk speeds up to 256K bit/sec.

Prices for the switches vary, depending on configuration. The CX 2000 ranges from \$18,000 to \$54,000; the MP 9000 ranges from \$21,000 to \$72,000; and the SP 9000 costs between \$11,000 and \$19,000.

Memotec Data, Inc., 600 McCaffrey St., Montreal, Que. H4T 1N1, or call (514) 738-4781.

■ Wang releases new Office/DISOSS software

Wang Laboratories, Inc. recently announced support for Systems Network Architecture Distribution Services (SNADS) through a new release of its Office/DISOSS Gateway software.

Wang Office/DISOSS Gateway Release 3.0 provides support for VS SNADS, an applica-

tion protocol that allows store-and-forward distribution between DISOSS and Wang Office electronic mail systems. VS SNADS enables a VS minicomputer to act as an Office Systems Node in a DISOSS environment.

This allows users to exchange E-mail between the systems and receive confirmation of delivery.

The gateway is supported by VS Access/Advanced Program-to-Program LU 6.2 Services, a

member of Wang's VS Access family of products that enables IBM users to gain access to VS systems.

Scheduled for availability in the second quarter, Wang Office/DISOSS Gateway Release 3.0 license fees range from \$4,200 to \$16,800.

Wang Laboratories, Inc., 1 Industrial Ave., Lowell, Mass. 01851, or call (508) 459-5000.

Net/Master gets a boost

continued from page 27

of if-then statements to figure out which NCL procedures need to be invoked to resolve the problem. Net/Stat can automatically invoke NCL routines that create a trouble ticket, issue device recovery commands or give operators suggested solutions to the problem.

To run any of Net/Master's features, users need Cincom's Net/Master Foundation Component, which is the base software module in the Net/Master modular software family.

Other Net/Master enhancements include:

- Inter-System Routing, a new feature that enables programmers to build a routing table that routes system messages from remote hosts to a central operations site.

- A feature that enables the Network Error Warning System of Advanced Network Management to receive alerts from network service points, such as IBM's NetView/PC. Network Error Warning System acts much like IBM's Network Problem Determination Aid by storing alerts in a data base for later analysis.

- A capability that enables NCL to update operator terminal screens asynchronously as changes in the network or system operation occur. Terminal operators previously had to acknowledge receipt of one screen before updates could arrive.

- The ability of Net/Master's Multiple Application Interface to forward terminal screens to other operators or to departmental printers. Previously, the Multiple Application Interface only enabled operators to log on to several different applications at once.

Upgrades and pricing

Upgrades with Net/Master 2.1, including ESF and Net/Stat, will be provided as part of the package price for the operating system. ESF ranges in price from \$1,700 to \$15,000, depending on the host operating system and model number.

Cincom Systems is located at 2300 Montana Ave., Cincinnati, Ohio 45211, or call (513) 662-2732.

Vitalink offers new TransLAN

continued from page 27

work management features, including a set of filters and traffic control capabilities that may be used to partition the wide-area network.

For example, data packets based on certain protocols can be blocked from certain local nets not equipped to handle them. Also, a real-time protocol, such as DEC's Local Area Transport protocol, can be given priority over batch jobs.



©1989 Racal-Milgo

We stand on our record, but never rest on our laurels.

We're working to add leadership in T1 to our history of achievement. And if our track record is any guide, we're the networking company you can count on for quality, reliability, and stability.

Our full T1 line is just part of a comprehensive range of network components that encompasses modems, DSUs, fiberoptic products, statistical multiplexers, data encryption products, X.25 systems, and network management systems.

What's more, we go far beyond hardware and software to provide total customer support in

82 countries...before, during, and after the sale. We can help you plan, design, implement, manage, and maintain any size network, anywhere in the world.

You don't have to take our word for it. For example, Datapro* said, "...a full-service systems supplier...solid products that perform as promised." And IDC** found Racal-Milgo holds the largest share of both domestic and international markets for network management systems. You can expect the same commitment and long-term performance from Omnimux 8000.

For more information, call toll-free **1-800-327-4440** (in Florida, 1-305-476-4811). Federal Government users, 1-800-327-7909 (in Florida, 1-305-476-4452).

Omnimux 8000. Now, that's more like it. But then, that's Racal-Milgo. Reaching beyond today's standards.

*Datapro, *User Ratings of Network Management Systems*, September, 1988.

**International Data Corporation (IDC), *Quantitative Analysis of the Network Management Market*, October, 1988.

Racal-Milgo®
RACAL

OPINIONS

AT&T

BY JOSH GONZE

The case of the Asian key systems

Like all established vendors, AT&T likes to shroud its actions in the cloak it calls "serving the customer." But AT&T did not attempt to make that claim last month when it served the U.S. government a petition demanding an end to the importation of inexpensive foreign key systems. Obviously, AT&T's purpose is to make a profit by selling high-priced key systems to customers whose demonstrated interests lie in low prices.

As far as users are concerned, the significant fact regarding key systems from foreign vendors — Asian companies, in particular — is that those systems offer the highest price/performance ratio available. It's irrelevant to the key system user that the product is made by individuals with non-U.S. citizenship in a location outside the jurisdiction of the U.S. government.

We should cheer users lucky enough to benefit from the "dumping" of products on the U.S. market because a foreign government chooses to subsidize their purchases. As critics point out, the subsidy represents a distortion of the true costs of production and distribution for that type of product. But it also creates a market opportunity for some other product because the only way for Asian governments to fund the key system subsidies is to tax some other segment of their economy. Draining that other segment creates opportunity for non-Asian businesses.

AT&T has a long history of playing on both sides of the regulatory fence, asking for legal restrictions in areas in which other companies fare well and calling for deregulation in areas in which AT&T feels it can compete effectively. That process continues today: With one hand, AT&T seeks to cut good deals with large business customers under Tariff 12, while the other hand signs a petition calling the good deals offered by Asian key systems vendors unfair.

The case of the Asian key systems is a striking example of AT&T manipulating its regulators into driving off its competitors. That old and crusty idea about delivering the right products at the right prices goes out the window.

But AT&T cannot be blamed for its two-faced position in the telecommunications industry. The company is simply behaving as would any business that is regulated by legions of federal bureaucrats. To AT&T, the regulators are just another factor in doing business, much like the actual supply and demand parameters that should properly determine the course of the telecommunications industry. As a business entity that must make a profit to justify its existence, AT&T has no choice but to manipulate the regulators, regardless of the effects on users.

The fundamental reason for regulation is that AT&T's interests run counter to those of users and, thus, users need regulatory protection. But a lot of regulation, such as the petitioned import restriction, has exactly the opposite effect. AT&T ends up protected from competition, and users end up paying higher prices for lower performance.

AT&T is a monolithic force in the telecommunications industry. But AT&T would also be extremely vulnerable if competition were not restricted by the government. In the long-distance carrier services market, which AT&T monopolized for 100 years, MCI Communications Corp. and US Sprint Communications Co. have achieved success in only five years.

If AT&T were now left to compete in a genuine free market for a period of 10 years or so, it probably would shrink to a shadow of its current \$35 billion self. The government bureaucrats in Washington, D.C. would be forced to find real jobs. Telecommunications users would enjoy a market supply closely aligned with market demand. And AT&T would probably be run out of the key systems business. □

Gonze is a research analyst, data communications equipment, at International Data Corp. (IDC) in Framingham, Mass. His opinions do not necessarily represent those of IDC.

NETWORK WORLD

Editor
John Gallant
Managing Editor
John Dix
Assistant Managing Editor — News
Charles Bruno
Senior Editors
Data Communications — John Cox
Management Strategies — Barton Crockett
Local Networking — Laura DiDio
Telecommunications — Bob Wallace
Senior Writer
Industry Update — Bob Brown
New Products Editor
Jim Brown
Staff Writers
Paul Desmond
Wayne Eckerson

Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
(508) 820-2543
MCI Mail: 346-0258
An IDG Communications Publication

Assistant Managing Editor — Production
Beth Lazarus
Associate Editors
Peter Hoffmann
Joanne McQuaid
Copy Editors
Liz Pappas
Tom Smith

West Coast Bureau Chief
Susan Breidenbach
501 Second Street, Suite 310
San Francisco, Calif. 94107
415-978-3160

Washington, D.C. Bureau Chief
Anita Taff
650 National Press Building
529 14th Street NW
Washington, D.C. 20045
202-347-6184

Contributing Editors
John J. Hunter
Ranjana Sharma

Features Editor
Steve Moore
Features Writer
Bruce Guptill
Associate Features Editor
Anne Ryder
Assistant Features Editors
Alison Coniffe
Susan Tricca
Art Director
Dianne Barrett
Informational Graphics Designer
Susan Champeny
Junior Graphic Designer
Susan Slater
Assistant to the Editor
Cheryl Tynan

President/Publisher
Gary J. Beach
Assistant to the President
Mary Fanning

EDITORIAL

Net planners take notice: Video's star is ascendant

Video almost always comes last on network managers' lists of the types of information they intend to integrate into their networks. Managers who've struggled to become marginally comfortable with integrating voice and data, and maybe even graphics and facsimile images, usually balk at the difficulty and expense of bringing video into the fold as well.

But video will come into its own during the 1990s. Telephone companies, cable system operators and satellite broadcasters are already digging in for a competitive free-for-all to determine which industry will dominate the lucrative video services marketplace.

In their Open Network Architecture plans and in their corporate alliances, the regional Bell holding companies have revealed their intent to deliver video services to their subscribers. And, no doubt, some third-party information providers would like nothing better than to put mom-and-pop video stores out of business by taking advantage of RBHC gateways and billing services to deliver programming electronically.

Cable service providers are actively testing technologies that will enable them to go beyond one-way video delivery and support a variety of interactive, multimedia information services. And the Federal Communications Commission seems favorably disposed toward allowing the cable operators and telephone companies to install

two competing fiber-to-home channels.

The broadcast industry can't afford to stand idly by as its market is invaded from two sides. While no company has succeeded in the U.S. with a direct broadcast satellite service, the idea isn't dead yet. As very small aperture terminals get smaller and less expensive, direct broadcast video services may become com-

Before the end of the 1990s, Picturephones will be common and videoconferences will be as much a part of corporate life as facsimile machines are today.



petitive with cable offerings. The toughest challenge for the broadcasters is to provide real-time interactivity, either through VSATs that transmit as well as receive, or by combining one-way broadcasts with terrestrial return paths.

At the center of the video battleground is high-definition television (HDTV). While most HDTV discussion today centers on the U.S. television industry's potential inability to compete

with Japanese makers of HDTV chips and television sets, there are plenty of other interesting angles to HDTV.

The high resolution of HDTV images will hasten the confluence of the previously separate worlds of analog video and digital graphics, spurring rapid growth in networked image-processing applications. Before the 1990s are over, users' desktop workstations will likely be capable of editing video images just as easily as they edit text today.

Finally, as networks are beefed up to handle transmission of animated digital graphics, three-dimensional engineering models and video, users will become familiar with a new class of applications: hypermedia systems.

Such systems, also called multimedia systems, will enable users to mix, match and manipulate any desired information type, including voice, data, graphics, images and video. Digital Equipment Corp., for one, has already announced a compound document architecture that eventually will incorporate all of the information types listed above.

Before the end of the 1990s, the day will finally come when Picturephones are common and videoconferences will be as much a part of corporate life as facsimile machines are today. Video is on the rise, and network managers that plan now to accommodate it will help their companies reap substantial competitive benefits. □

OPINIONS

NETWORK DESIGN

BY CHUCK PAPAGEORGIOU

Telecom professionals fly by the seat of their pants

To successfully design telecommunications networks, network architects must make many choices and designers must accept many trade-offs. After years of debate, one sobering thought reflects the state of our profession and our industry in general: Telecommunications is not an exact discipline.

Parts of it are based on technology and are well-defined science. The existence of formulas and algorithms such as Erlang and technical standards such as X.25 prove this. The sad truth, however, is that most of it is based on semiscientific methodology (otherwise known as SWAG — Scientific Wild Ass Guess) and driven by business and user requirements.

Telecommunications professionals are not trying to create order out of chaos or define what the future will be. They are trying to solve business problems and meet user requirements.

As John McQuillan wrote in a recent column ("The opportunity that most users continue to neglect," NW, Dec. 12, 1988), most organizations don't even have a telecommunications plan and are almost exclusively business-driven.

As a result, we implement and manage multiple networks, each one of them a unique solution to a business problem designed around a specific application or user requirement. We buy equipment from vendors that use proprietary architectures, support telephone companies that can't agree on standards and battle new fires every day. Telecommunications is indeed an acid test of ability and courage.

In most disciplines such as electronics and computer science, systems designers operate within predefined guidelines (an architecture). In telecommunications, systems designers have all kinds of options available to them and almost no guidelines. Take, for example, a designer charged with the task of creating a new voice/data net. The guidelines for doing so are mostly business-driven.

Papageorgiou is the manager of technology and standards for the telecommunications department of United Parcel Service, Inc. in Paramus, N.J.

The designer sets the priorities so that the network design:

- saves the company money.
- pays for itself in two or three years.
- supports all the existing and (God forbid!) any planned new applications.

The system designer evaluates the equipment available on the market and determines which technology will save the organization the most money or will support all of its existing applications. The designer then at-

Telecommunications systems designers have all kinds of options and almost no guidelines.



tempts to put together a network that is totally cost-effective and efficient.

Then, three months later, Network Rule No. 1 takes effect: Networks never stay the same. A new office opens, a carrier files new tariffs and a new transmission technology emerges. The design that was so meticulously implemented is now outdated.

What happened? Whose fault is it? Should we fire the network designer, blame it on the business manager that opened the new office, complain to our friendly marketing representative or blame it on those darn engineers with nothing better to do than invent new gizmos?

In many companies, these are not options. A better one is to ask the designer to figure a way to tune the design to save more money, then go to upper managers and tell them the company can save money by implementing the new design.

It's a vicious cycle, isn't it? Yet that is how most of today's networks — and even Systems Network Architecture — were designed. To break the cycle, we must learn from past mistakes, such as those IBM made when it faced a connectivity problem: too many pieces of equipment, no plan in place and a whole bunch of users screaming for connectivity (yes, that word existed back then).

So IBM put all its brains to-

gether and designed the best network for its products — a hierarchical network with the host doing most of the work — and built an architecture around it. Then Network Rule No. 1 took effect: Customers started asking for peer-to-peer connectivity.

IBM responded by tweaking its design and turning SNA into a schizophrenic, hierarchical/peer-to-peer network. And then users said they needed interoperability with other vendors, X.25 and Open Systems Interconnection compatibility, as well as a network management system that was (oh no!) user-friendly. Once more, IBM had to respond, and the vicious cycle started all over again.

Let's also learn from past successes. When AT&T was chartered with building the telecommunications network for North America, it decided to base the network on a single architecture. The architecture was laid down, and the designers and engineers went to work to implement it. The North American telephone network was not built in a day. The design was not the most cost-effective, but it was built on simple standards that are still in use today.

Then technology changed, going from the step-by-step central office to the crossbar switching system to computer-controlled switching all the way to the gee-whiz central offices of today.

Users changed. Their needs went from plain old telephone services (POTS) to pretty amazing new stuff (PANS). Today's user wants 19.2 Kbit/sec speeds for data transmission, full-motion video applications and ISDN. "And could you please do Windows, too?"

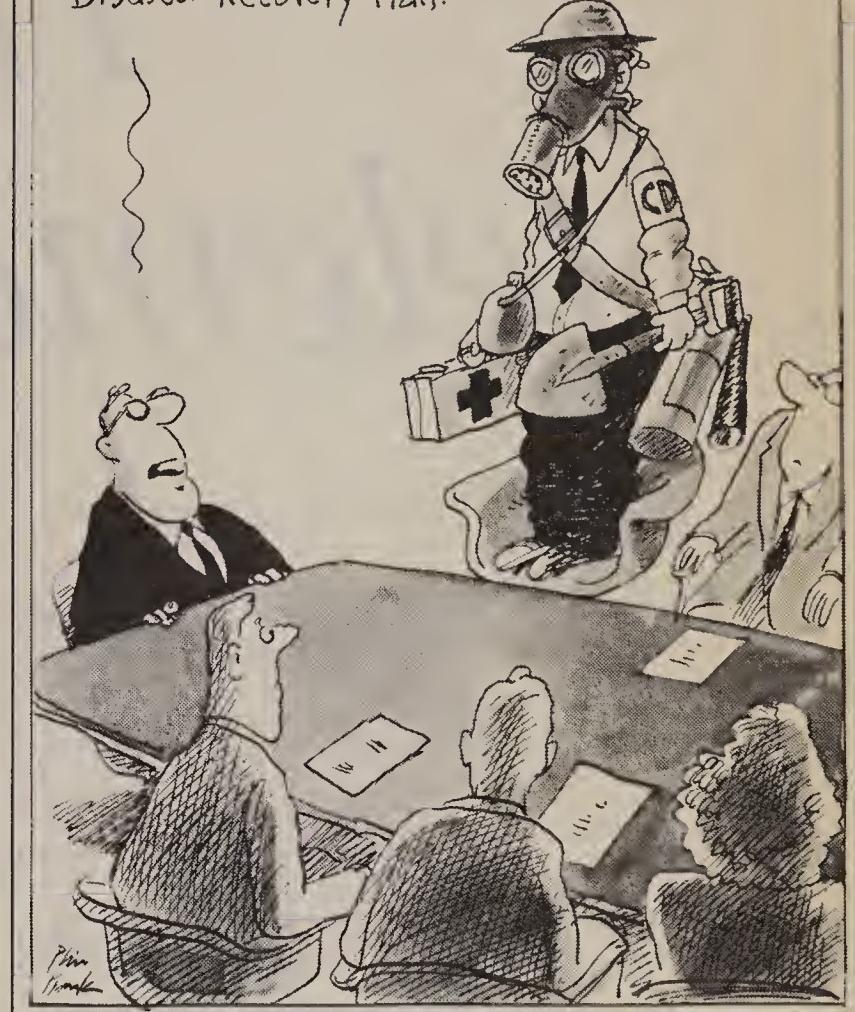
The design of the network is constantly being reviewed and revised; even Ma Bell is not there anymore (thanks to our friends in Washington, D.C.). An analog central office can be forklift-replaced with a fully digital system, and four-wire cotsrunks can be replaced with fiber. One thing didn't change, however: The architecture that was laid down many moons ago is still there.

Let the technology for our industry grow and mature. Let the network designers find more ways to optimize networks. But for crying out loud, decide on the architecture and *then* design the network. □

TELETOONS

BY FRANK AND TROISE

Thank you, Ed, for that enthusiastic report on the network's Disaster Recovery Plan.



LETTERS

AT&T within its rights

Your recent editorial, "AT&T manipulates the system to its own advantage" (NW, Jan. 30) misses the point in saying that AT&T is "taking the law into its own hands" by proposing innovative tariffs such as Tariffs 12 and 15.

The fact is that we are doing everything we can *within* existing regulations to anticipate and meet our customers' needs and to stay strong in an increasingly competitive marketplace.

The business long-distance market is not standing still. And AT&T will not stand idly by while our competitors serve the market unfettered

and use the regulatory process against us.

We agree with Leon Kestenbaum, the lawyer representing US Sprint Communications Co., who said that our decrease in market share, among other things, reflects the intensely competitive nature of the long-distance marketplace. Companies in such a

(continued on page 42)

Network World welcomes letters from its readers.

Letters should be typed, double-spaced and sent to Editor, Network World, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701.

Letters may be edited for space and clarity.

THE CLASH OF IDEAS IS THE SOUND OF FREEDOM.

And the most productive way to let your ideas clash with those of others in the telecommunications industry is to sit down and write a guest column for *Network World's* Opinions pages. After all, it is a free country.

Columns should be timely, opinionated, literate, thoughtful and accurate.

Manuscripts should be letter-quality, double-spaced and between 600 and 900 words in length. Disk or modem submissions are preferred.

If you'd like to write a column, contact Steve Moore, features editor, *Network World*, Box 9171, Framingham, Mass. 01701, or call (508) 820-2543, ext. 732.

FEATURES

The telemanagement symphony

Keeping operations finely tuned and synchronized can be a challenge to today's telecom manager.

By LILLIAN GOLENIEWSKI and ANDREA WELLS

Symphony conductors and telecommunications managers have more in common than they realize.

Just as the conductor uses a baton to give the musicians instructions and "manage" the concert, so do organizations use telemanagement software to control their networks and manage their telecommunications environment.

And just as the conductor must coordinate the harmonious interaction of such diverse types of instruments as woodwinds, strings and percussion, so too must a telecommunications manager direct the different factions within the company to work together to choose the telemanagement system best suited to the organization's needs.

While the initial choice of operating environment may seem to be driven by corporate data

Goleniewski is president and Wells is director of research at The Lido Organization, Inc., a Mill Valley, Calif.-based independent consulting and training firm specializing in telecommunications network management.

processing standards or cost investment differences, users should assess the political climate between the telecommunications and DP/MIS groups before reaching a decision. Often, corporate politics intervene in a telemanagement system's success.

Political concerns

After defining the basic system capacity requirements necessary to support their telemanagement applications, users should ask themselves the following questions:

- Is MIS merged with telecommunications, and do the groups work well together? Many a mainframe system falls short of the mark because DP doesn't understand telecommunications and the important role telemanagement systems play.
- Does the telecommunications department want autonomous control of the telemanagement functions? If so, a departmental system, such as a dedicated minicomputer, may offer the most benefits. However, with autonomy comes more responsibility for the system — a system that will become increasingly crucial as its

benefits become more visible to executive management.

■ Will the use of a telemanagement system increase the political clout of the group implementing it? The clever use of information systems will enhance the bottom line of any organization. This opportunity to command boardroom visibility may influence the user's choice of hardware operating environments.

■ Who will authorize the purchase of a telemanagement system, and how critical is price to this choice? How will politics and required purchasing approval affect the time involved in approving and acquiring a product?

Keeping in mind the four political questions just posed, we can look at today's telemanagement alternatives: the mainframe, minicomputer, microcomputer and service bureau offerings.

Of course, the most critical aspect of system selection is how the applications provided fit with internal information needs. Beyond system capability, users must always remember to assess the more subtle political concerns of system control, internal cooperation, cost sensitivity and

managerial clout.

Each of these choices has pros and cons, and many of the traditional distinctions between operating environments and the types of telemanagement functionality available on each are disappearing. Certain user-driven needs, such as on-line inquiry, multi-tasking and historical reporting, are becoming more and more common in all types of software packages. Some of the most successful installations have combined operating systems to maximize telemanagement benefits.

Mainframe-based software

The use of a mainframe computer may be dictated by virtue of

its existence in the company, or it might be the favored environment for complex systems that require sophisticated MIS support. Mainframes can handle the batch processing of high-volume call-accounting systems while providing fully integrated telemanagement applications with sophisticated functions for large organizations and communications networks.

If centralized management and control is required, mainframes can be used as the focal data base point, working in a distributed DP mode to provide individual locations with some level of telemanagement functionality through the use of microcom-

ers. The remote locations can then interact with the central data base to maintain a corporate network profile.

Mainframe telemanagement systems have many advantages. Not only do they have more processing power and higher speeds, they also have virtually no capacity limitations. They allow for multiple users and can run a variety of sophisticated applications. Generally, MIS departments are familiar with mainframe computing and will have little or no trouble supporting it — meaning less support responsibility for the telecommunications staff.

Mainframe telemanagement
(continued on page 34)



ILLUSTRATION ©1989 CHRIS DEMAREST

(continued from page 33)

systems have drawbacks, however. The telecommunications department has less direct control over the system, and consequent job scheduling, and will have to interact with MIS more. Although MIS is familiar with the mainframe environment, it has less operational expertise when dealing with telemanagement system support and maintenance. Users will have to put up with slower responses to change requests. They will also find higher costs associated with mainframe usage for the initial software purchase, and, if the organization practices CPU chargeback, they will have higher internal costs.

Top industry providers of mainframe telemanagement systems include: Telco Research Corp. of Nashville; Stonehouse and Co. of Dallas; Communications Design

Corp. of Stamford, Conn.; and Cincinnati Bell Information Systems' Communications Management Systems of McLean, Va.

Mini-based software

While the minicomputer telemanagement software option has commonly been used as a departmental solution that provides applications as sophisticated as the mainframe, the traditional distinctions between minicomputers and supermicrocomputers (32-bit processors with windowing capabilities and high-resolution graphics, such as Sun Microsystems, Inc. workstations) are becoming more and more hazy. For organizations with systems requiring multiple users, multiple applications and high-volume capability, as well as those requiring multitasking and system partitioning, the minicomputer presents a

viable alternative.

Using minicomputers for telemanagement allows users to have departmental autonomy, as well as immediate control over report and request turnaround times. The minicomputer operating environment can also accommodate multitasking and multiuser capabilities, and it has lower processing costs than the mainframe. Recent cost reductions in the minicomputer market have also enhanced the practicality of the minicomputer telemanagement solution. Both Hewlett-Packard Co. and AT&T offer minicomputers priced at less than \$15,000.

The disadvantages of minicomputer software include possible limits on system capacity, greater capital investment than a microcomputer solution and a requirement for more telecommunications exper-

tise and training in administering an autonomous system as opposed to an MIS system.

The price range for minicomputer software packages is very wide. They can be found at prices comparable to both high-end microcomputer and low-end to mid-range mainframe packages.

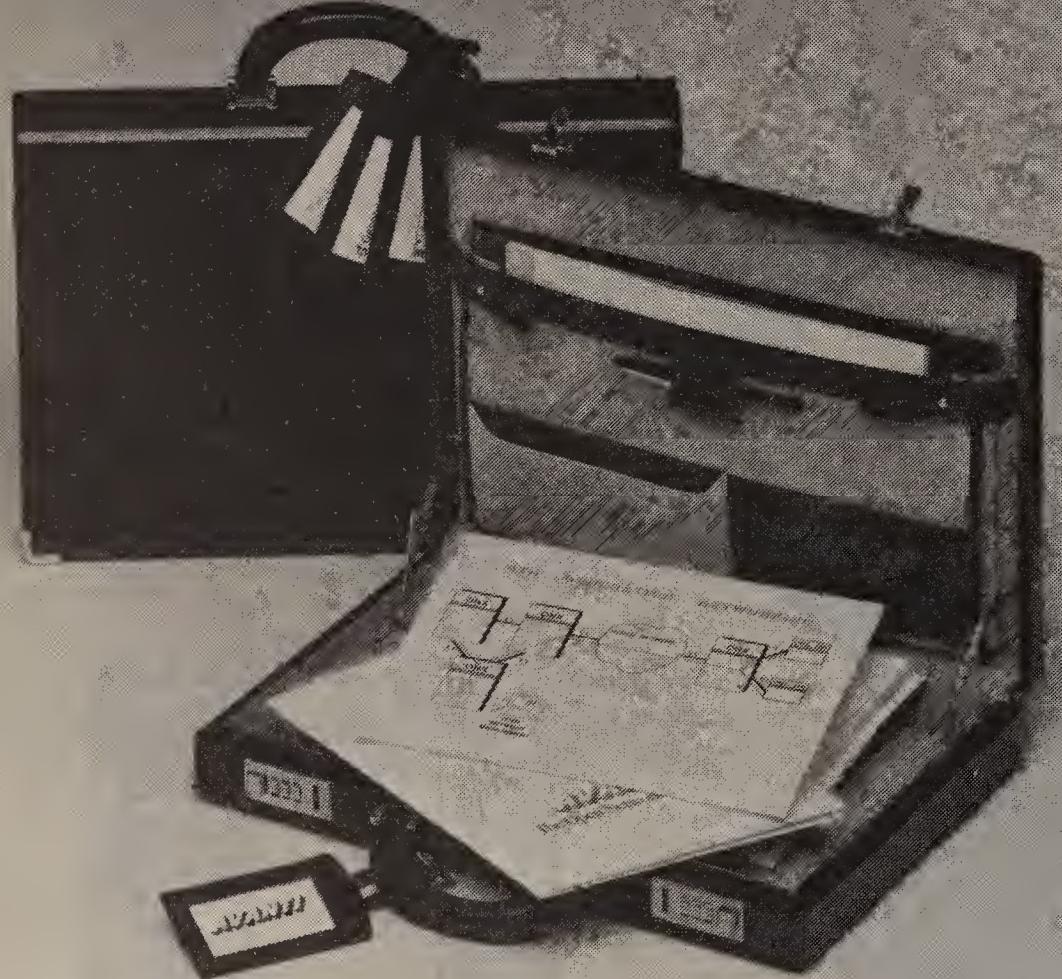
The major vendors of minicomputer-based software are: Communications Group, Inc. of King of Prussia, Pa.; Comsoft Management Systems, Inc. of Houston; NEC Information Systems, Inc. of Boxborough, Mass.; Telco Research; and TelWatch, Inc. of Boulder, Colo.

Micro-based software

The microcomputer market for telemanagement software is growing quickly. The introduction of the more powerful Intel Corp. 80386 processing chips and local networks, as well as the promise of multiuser capabilities through IBM's OS/2, will remove many of the traditional limitations of microcomputer processing.

Today, call collection buffers and background/foreground operations make multitasking possible. Multiple users can access microcomputer telemanagement systems today by operating in a local net-

NOT ALL T1 NETWORKING VENDORS ARE BEING COMPLETELY OPEN WITH YOU.



Other T1 vendors that claim open connectivity are not being completely open with you.

Sure, the other vendors will eventually offer an open architecture for your T1 backbone—but if you want to be in sync with the direction of the industry (2-3 years early!) Avanti's Open Network Exchange (ONX™) offers this today.

The ONX product line is fourth generation technology and conforms to Open Network Architecture and industry standards, allowing the construction of Virtual Corporate Networks (VCN). Virtual networking creates the ability to interconnect the T1 corporate backbone network to all enhanced public switched services, while under the control of a single network manager.

In fact, Avanti is the vendor compatible with AT&T Megacom/SDN, US Sprint VPN and MCI V-NET virtual services.*

How does this benefit you?

It means you reduce your telecommunications costs and gain greater flexibility through access to public and private network services over the

same T1 facilities. You increase reliability through the redundancy of a robust, ubiquitous public switched network. And you can initiate new applications and bring your most remote locations on-line very quickly and easily.

Very simply, Avanti gives you more options, more flexibility, without the risk of obsolescence.

A network that isn't open, isn't open to growth or opportunity. And that means a company that chooses an open network gains a vital edge over their competition.

That's why Avanti is the choice.

The Open Networking choice for today. And the future.



The Open Networking Choice

Avanti Communications Corporation
Aquadneck Industrial Park, Newport, RI 02840

I-800-535-3550

*AT&T Megacom/SDN, US Sprint VPN and MCI V-NET are all trade or service marks of their respective companies

Using minicomputers for telemanagement allows users to have departmental autonomy.



work environment, using multiuser personal computers and by operating in a Unix environment. The predominant telemanagement application served by traditional personal computer systems, such as the IBM Personal Computer XT and AT, remains single-function call accounting.

But new and more powerful microcomputers and increased user demand for complete, integrated telemanagement have focused much attention on the development of expanded functionality for microcomputer-based systems. The workstation is evolving into the dominant user interface to telemanagement; for example, AT&T's NetPartner product for Centrex, Software-Defined Network and Integrated Services Digital Network management uses Sun workstations. This evolution has created a new generation of telecommunications and net management based on distributed DP approaches.

Microcomputer-based telemanagement systems require less capital investment than those based on minicomputers or mainframes, and they have lower processing costs.

Users also have the advantages of more user-friendly interfaces and more direct control over report and request turnaround times. Another important advantage of a microcomputer-based system is that the users have total autonomy and direct control over the system.

However, there are several disadvantages to using microcomputer-based telemanagement. System capacity and processing power are limited. With traditional personal computers, call-record costing and report-printing processes can be slow, depending on volume. Also, if not operat-

ing in a local network or Unix environment, only one user can access the system at a time. Total telecommunications departmental responsibility means an increased need for internal computing knowledge and training.

Again, it is important to notice the extent of improvements possible as microcomputer capabilities expand. Quite a few systems now available provide real-time call costing, allowing faster call processing when ad hoc reporting is necessary. The increasing availability of on-line inquiry eliminates the need to generate full reports. Multiuser systems can be configured around a local network using Unix and, in the future, OS/2.

The top vendors of integrated software applications designed to run on a microcomputer-based system are Communications Group; Comsoft Management Systems; Softcom, Inc. of New York; Telecommunications System Management of Harvester, Mo.; TelWatch; and Xtend Communications of New York.

New facilities management products that are being integrated with existing call-accounting software for microcomputers are announced almost monthly. New vendors in this market include Summa Four, Inc. of Manchester, N.H., and Xiox Corp. of Burlingame, Calif.

Service bureaus

While the overall trend in telemanagement is toward customer-owned software, the service bureau marketplace can still provide a viable solution. For either internal or resale billing, a service bureau can handle the responsibilities of managing systems. Also, off-loading management tasks to a service bureau will obviously eliminate the high capital expenses associated with an on-site telemanagement system. Service bureau providers have also begun to sell on-site facilities management software as well as to provide off-site call-accounting services.

The advantages associated with service bureau applications include less internal responsibility for start-up and system cutovers, and greater vendor familiarity and expertise with telemanagement functions. Cost savings can also be realized by off-loading the need for internal staff time, training and capital expense.

The disadvantages associated with the service bureau approach center around the inability to directly access and manipulate the system applications. This can include slow turnaround times and reporting, lack of report feature customization often provided with custom report generators, threatened data security and higher processing costs than with internal utilization.

As the end-user demands for telemanagement system control and functionality have increased, service bureaus have looked less and less attractive. However, service bureau providers can be expected to expand the range of their services.

Better-known service bureau providers include Account-A-Call Corp. of Burbank, Calif.; Aud-Cyn Associates, Inc. of Parsippany, N.J.; Communication Sciences, Inc. of Edison, N.J.; Communications Group; Communications Management Systems, Inc. of McLean, Va.; and Compco, Inc. of Brentwood, Tenn.

When beginning the search for a vendor of telemanagement software, remember the nature of this particular industry within telecommunications. With the rapid growth of software packages on the market today, certain offerings will obviously be unable to compete for any extended length of time.

Many new vendors offer excellent telemanagement products, but when actually choosing a provider, users should try to ascertain how stable the vendor will be a few years from now. Distributors of telemanagement software may not be fully committed to supporting the products they are selling. Users must assess alternative support avenues for the future.

Ancillary hardware

Besides choosing operating hardware, users must assess if and where they need peripheral hardware, as well as whether they want the peripheral hardware attached directly or remotely to their telemanagement systems.

Peripheral hardware captures and records data from a switch or switches, and then stores that data temporarily until it is

polled by the system. Both call detail records and station message detail recording (SMDR) data and alarms can be captured and fed into the telemanagement system. SMDR data can be translated and then fed to the call-accounting and traffic modules for processing.

Alarms collected from a switch can be monitored at the site of collection and fed into a problem-tracking module to assist in pinpointing failures — failures that may direct attention to a deteriorating situation. This allows users to rectify a situation before it becomes a full-blown problem.

Many call-accounting products require a buffer box, which allows the user to perform other tasks with the telemanagement system and still ensure that data is collected from the switch at all times.

Alarm-monitoring devices for teleman-

agement systems are still quite new. Several firms provide switch-specific alarm monitoring and a basic translation of those alarms with integration into the problem-management module. Future applications of alarm monitoring could include some level of expert system that might receive the alarm, search its records for similar problems and then actually open a trouble ticket with an advised resolution already provided.

Peripheral hardware is manufactured by several firms, including Com Dev, Inc. of Sarasota, Fla.; TSB International, Inc. of Rexdale, Ontario; and Western Telematic, Inc. of Santa Ana, Calif. Many telemanagement system providers will buy products from OEMs, put their own names on them and link them into their system.

(continued on page 42)

Expanding The Limits Of Telecommunications

Leading-edge technology in a telecommunication system is no longer a luxury. At Hitachi, we offer the kind of advanced technology that gives your business the competitive edge it needs. Because we understand that your communication system is more than a convenience; it is your business lifeline.

Advanced technology from Hitachi. The brightest star in telecommunications.



Hitachi America, Ltd.
Telecommunications Division
1-800-635-7500

UPWARD COMPATIBILITY

SEE US

NETWORLD 89SM

FEBRUARY 28, MARCH 1-2 BOSTON
HYNES CONVENTION CENTER BOOTH #318

LUCK HAD NOTHING TO DO WITH IT.

Strategy did. SynOptics Communications planned its LattisNet architecture to meet current customer needs while providing an upward migration path to the emerging 10BASE-T standard.

SynOptics' commitment to standards is built into each and every product we make. And it's been that way from the beginning. Today, LattisNet provides IEEE 802.3, AUI-compatible Ethernet at 10 Mb/s over unshielded twisted pair wire and a variety of other cabling media. Tomorrow, it will satisfy the new standard by offering 10BASE-T versions of LattisNet twisted pair host modules and twisted pair transceivers.

You'll simply install 10BASE-T LattisNet host modules into an existing premises or department concentrator. The new host modules and transceivers will provide 10BASE-T unshielded twisted pair compatibility and the AUI compatibility we offer today — while working right alongside the current LattisNet host modules in your networks. SynOptics' upward migration path to 10BASE-T has been built into the LattisNet architecture, starting with the very first concentrator we ever shipped.

Don't rely on luck. Rely on LattisNet.



SynOptics
Communications, Inc.

For more information on
SynOptics' upward migration
path, call toll-free
(800) USA-8023, Dept. 100.

501 East Middlefield Road, Mountain View, CA 94043-4015

LattisNet is a registered trademark and SynOptics is a trademark of SynOptics Communications, Inc. © 1988 SynOptics Communications, Inc.



TOKEN-RING LANs

Token LANs gain ground on Ethernet

CONTINUED FROM PAGE 1
ucts. Burke alludes to the signal latency delay problem that exists with large networks and the fact that the delay is increased with smaller frames.

"People complain about poor performance when they're ready to send and the token hasn't arrived yet," he explains. However, now that the Early Token Release (ETR) feature has arrived, latency delay could be a thing of the past.

Ethernet has its problems too, and it's not only with 16M bit/sec token ring. Gail James, president of the LanQuest Group Corp., a Santa Clara, Calif.-based consulting firm, has strong evidence that speed doesn't necessarily make for an efficient local net system. "We've done a lot of LAN testing here, and we've observed that

Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

with a heavily loaded network, you'll get 90% of the throughput of an Ethernet using a 4M token ring. We expect the 16M to provide between three and 3½ times the throughput of Ethernet," he says.

James says that Ethernet's carrier-sense multiple access with collision detection method isn't as efficient as token passing. Since CSMA/CD is not a deterministic access method, packet collisions do occur on heavily loaded networks and when large packet sizes are involved.

Although statistics have been published showing that only 40% of Ethernet's capacity would be reached if several hundred stations were all operating concurrently, James says, "That might be true for that particular [configuration], but I can show you one where 30 stations using large packets and quick access requests will bring the network down."

The controversy over whether

token ring is superior to Ethernet has resulted in some strong charges being made by a few Ethernet proponents concerning the new 16M Token-Ring, and some have been published in the trade press (see the accompanying sidebar, "IBM responds to Token-Ring critics," page 38).

Real intent

With all the ink IEEE 802.5 and Fiber Distributed Data Interface (FDDI) have been getting, it's easy to forget that the older 802.4 token bus and proprietary schemes such as Datapoint Corp.'s Arcnet are still alive.

Token-bus local nets are broadband systems that use coaxial cable as the backbone. Frequency-division multiplexing divides the bandwidth into multiple channels that are assigned specific applications or classes of users, and a head end takes care of channel routing. Access to the

Chart Guide

The features and prices of various token-ring local nets are listed in a chart on page 40.

(continued on page 38)



(continued from page 37)

backbone is handled by passing a token among stations.

While token bus was the darling of the industry at the start of this decade, today it is popular primarily at universities, where video applications are common, and at manufacturing sites, especially those using the Manufacturing Automation Protocol, which specifies use of the token bus.

A few proprietary local nets continue to flourish thanks to their proven performance, choice of transport medium and price. Like token bus, they're capable performers, but they've been overshadowed by token ring.

Selection criteria

A few important features to look at when shopping for a local net are the num-

ber of user data bytes in each message frame, the number of stations allowed, the backbone transport medium supported and the efficiency with which stations are serviced. For token-ring local networks, an equally important consideration is whether or not a redundant backbone link is supported.

The number of user data bytes per frame indicates the amount that can be transmitted during each token pass. For interactive applications such as those that run on the IBM 3270, in which only a screen of data is passed, it's not too important; but for large data blocks such as those encountered with file transfers, it really matters. Some proprietary and 802.5-compliant local network vendors really get pasted in this area because of their small data fields.

For example, Arcnet-type local nets handle up to 508 bytes, and NCR Corp.'s NCR Token Ring System — an 802.5 4M bit/sec unit — holds only 2K bytes. The real winners of the data-carrying contest are Concord Communications, Inc.'s two entries. Their data fields hold up to 8K bytes.

The size of the message frame is determined by the amount of random-access memory on the local net adapter card. IBM recently increased its RAM from 16K to 64K bytes, thus allowing frames of 4K and 18K bytes, respectively, for the 4M bit/sec and 16M bit/sec Token-Rings. The 16K bytes of RAM offered with the initial 4M bit/sec local net limited the frame to 2K bytes.

The most commonly used backbone media for token-ring nets are unshielded

**"I wanted to go
with a wide area network company
that had really been around.
Vitalink's done it 5,000 times."**



When you're consolidating your Ethernet
or token ring LANs into one wide area network,
it's no time to fool around.
Pick the company with the most installations.



VITALINK
The LAN Bridging Company
800-443-5740

IBM responds to Token-Ring critics

There's been a lot of mudslinging between token-ring and Ethernet loyalists for some time, but things have gotten almost vicious since IBM introduced its 16M bit/sec Token-Ring product several months ago.

Ethernet proponents, afraid of losing market share, are bringing out statistical data that allegedly proves the Token-Ring Network's source routing is inefficient in large, heavily loaded networks. This data also reportedly shows that IBM's Token-Ring Bridge Program for the Personal System/2 Model 80 is so inefficient it will reduce overall network performance to a snail's pace.

Network World recently offered IBM the opportunity to respond to some of the more frequently mentioned Token-Ring criticisms:

Claim: The Token-Ring Bridge Program running on a Personal System/2 Model 80 allows a packet-processing rate of only 1,000 frames per second with a typical frame length of 100 to 125 bytes.

IBM: The Token-Ring Network 16/4 Adapter — as part of a ring-to-ring bridge using a Personal System/2 Model 50, 70 or 80 — is capable of scanning frames at a maximum ring frame rate to identify those frames that are to be forwarded. Maximum ring frame rate depends upon both the ring speed and the frame size.

For example, if the average frame size is 256 bytes, the maximum ring frame rate would be approximately 1,950 frames per second on a 4M bit/sec ring and about 7,800 frames per second on a 16M bit/sec ring. Measurements utilizing two 16/4 adapters installed in a Personal System/2 Model 80 showed that with a frame size of 256 bytes, more than 1,700 frames can be passed bidirectionally. If the frame size is increased to 4,096 bytes, more than 220 frames per second can be passed bidirectionally.

Claim: Source routing prohibits load balancing using parallel bridges because it does not allow coordination of route selection among stations.

IBM: The dynamic source routing process allows the selection of optimum routes for communications between two end stations across any existing multiple parallel paths, including bridges.

Claim: Since source routing generates route discovery packets, when one terminal in an extended local network wants to send information to another, the network can be flooded with discovery packets and cause route time-outs.

IBM: The discovery process — used to determine the optimum route between end stations — is employed only once at the institution of the logical connection and not with every data packet. Instead, the route is cached for the duration of the connection.

Claim: If a station loses its cache of best routes, the route discovery process must begin again. If multiple stations

(continued on page 41)

and shielded twisted-pair wire, and fiber-optic cable. Unshielded, or common telephone-like cable (IBM Type 3 cable), is inexpensive and easy to run between workstations and a wire closet.

But a drawback to unshielded twisted pair is that fewer workstations can be configured per ring. IBM specifies — and, therefore, so does the rest of the industry — that no more than 72 stations are allowed with unshielded cable, as compared to 270 stations with shielded cable (IBM Types 1, 2, 5, 6, 7 and 9). The reason for the 72-station limit is phase jitter, which is passed from station to station in token-ring nets. Beyond 72 stations, the rate of bit errors increases for unshielded cable.

With its 16M bit/sec Token-Ring, IBM requires fiber-optic cable between wire closets. But if the closets are close together, data-grade twisted-pair wire can be used.

The fiber cable can be 50/125, 62.5/125, 85/125 or 100/140 micron type, and it requires the use of a pair of Model 8220 dual-rate (4M bit/sec or 16M bit/sec) fiber converters. With fiber, the distance between wire closets can be up to two kilometers.

Some potential customers are balking at the idea of having to use expensive fiber-optic cable instead of twisted pair. "That could be a real roadblock to [the 16M bit/sec Token-Ring's] success, since a lot of people we've been talking to have a real problem with fiber," says Mary Modahl, an analyst with Forrester Research, Inc., a market research firm in Cambridge, Mass.

The problem might stem from the purchase price of the fiber, the costs associated with pulling it (up to \$100 a foot in some locations) or the lack of space in cable conduits. In any case, it could be a problem for some companies. Right now, the alternative for those needing high data rates on shielded twisted pair is Proteon, Inc.'s PRONET-10.

Redundancy

Backbone redundancy, which is part of the 802.5 recommendation, can be achieved by running a second physical link that is switched automatically or manually when the primary unit fails.

IBM implements fiber-optic redundancy (it calls it dual-ring configuration) through a fiber pair and two Model 8220 converters. One fiber is the primary link, and the other is the secondary; in the event the primary fails, both converters automatically perform an internal wrap to the secondary link. If either converter fails, an autowrap is performed around it.

Two separate fiber-optic links are not required. Rather, the secondary link is established within the same link by way of a fiber pair. This is essentially how it's done with FDDI also.

With 4M bit/sec token-ring redundancy, two separate cables

are used and the multistation access unit (MAU) plays the key role in achieving the switchover when the primary path fails or becomes unusable.

In a physical ring topology, failure of an MAU or backbone disables the network unless the MAU has a data wraparound facility or the local network supports a redundant link.

With the MAU wraparound facility, an MAU failure that threat-

ens to break the ring is detected by the ring's other MAUs. They then go into a wraparound mode, in which data passing into an MAU is transmitted back out of it instead of being passed to the next MAU.

Of the vendors covered in this Buyer's Guide, Proteon, Gateway Communications, Inc., IBM and Madge Networks, Ltd. have implemented redundancy. The only Arcnet-class product with redund-

dancy is from Thomas-Conrad Corp.

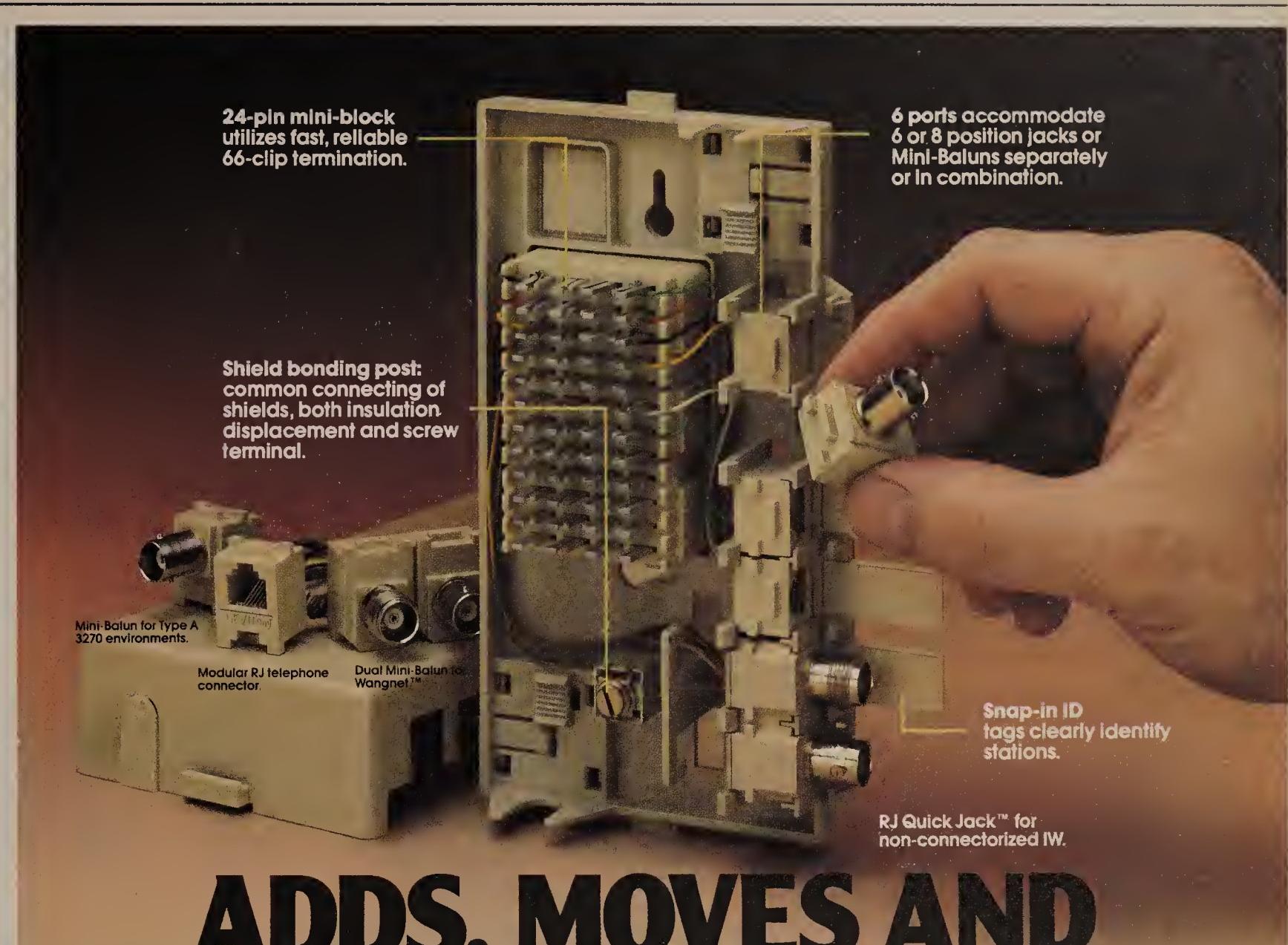
ETR eliminates drag

One of the more significant performance drags on token-ring local nets is the inherent propagation delay that results as the signal traverses the network. Since the broadcasting station won't release the token until it sees its own source address in the header of the packet circulating

around the network, the delay increases as the ring gets physically longer or the frames get shorter.

The aforementioned ETR available with the 16M bit/sec Token-Ring allegedly remedies the latency problem by allowing the station to release a token as soon as it has completed transmitting its message frame. ETR also optimizes bandwidth utilization by allowing multiple frames

(continued on page 40)



ADDS, MOVES AND CHANGES JUST BECAME A SNAP.

Leviton's modular multi-jack adapter system slashes installation costs.

Adding a voice station? Snap in the RJ. Need an instant terminal on spare pairs? Snap in the Leviton 3270 Type A or Wangnet™ Mini-Balun™ next to the RJ. Adapting for 10mb Ethernet on twisted-pair? Snap in the RJs, punch down the pairs on the internal 24-pin 66-block and it's tied in! Individual jacks or baluns are easily clicked in and out of the housing. Port assignments are identified by removable ID tags.

Install what you need for the cut, then economically terminate adds, moves, and changes in the same enclosure. Just snap in required jacks or baluns. Leviton's new multi-jack adapters can terminate 1 to 6 modular connection ports on new or embedded twisted pair. **RJ Quick Jack™** offers standard 66-clip speed and dependability for non-connectorized IW. For 25-pair connectors, use **Adapter Plus™**.

Coax elimination without extra connections means less reflected signal, less RFI/EMI. Our Mini-Baluns, in fact, let you maintain a shielded coaxial pigtail right to the wall connection point. Standard baluns add troublesome extra points of

connection. These transitions from twisted-pair to jack, to line cord, to balun, and back to BNC can spell trouble. Especially since users often extend noisy silver satin cord beyond acceptable limits.

Adaptability is the hallmark of Leviton's entire family of communications wiring products. Modular jacks, in virtually every configuration, and Mini-Baluns are interchangeable throughout—from singles and duplexes to 12-port models. Installer-engineered features also deliver unequalled installation adaptability.

But then the quality of our multi-jack adapters is no surprise. Leviton has been a leading manufacturer of quality wiring devices since 1906. For details see your local Leviton distributor, or contact **Leviton Telcom**, 2222 22nd Street SE, Bothell, WA 98021-4416. Phone toll-free 800-722-2082. Fax 206-483-5270.



Adapter Plus™ for 25-pair connectors.

LEVITON
TELCOM

U.S.A. and foreign patents pending. ©1989 Leviton Manufacturing Co., Inc.

Token-ring local networks

Vendor	Product	Compatibility	PCs supported	Backbone medium	Backbone speed (bit/sec)	Redundant link support	Maximum number of stations supported	Devices per MAU	Packet data field (bytes)	Network operating system	Network protocols	Gateways	Price*
Allen-Bradley Co., Communications Division Ann Arbor, Mich.	LAN/PC	Proprietary (Arcnet)	IBM PC AT	Coaxial (broadband)	2.5M	No	1,275	NA	510	NetWare, VINES, 3+	Arcnet at LLC	IBM SNA, asynchronous, X.25	\$25,800
	LAN/1	Proprietary (Arcnet)	IBM PC XT	Coaxial (broadband)	2.5M	No	10,000 (using 4 CATV channels)	32	253	Arcnet	NA	None	\$10,000
Concord Communications, Inc. Marlborough, Mass.	Token/Net Interface	802.4	Any	Coaxial (broadband)	10M	No	1,000	12	8K	Serial Port Application	OSI	None	\$14,400
	MAPware	802.4	IBM PC XT, AT, PS/2	Coaxial (broadband)	10M	No	1,000	1	8K	Manufacturing Messaging Specification	MAP	Ethernet	\$61,400
Datapoint Corp. San Antonio, Texas	Model 77XX, 78XX, 79XX	Proprietary (Arcnet)	IBM PC XT, AT, PS/2	Coaxial, fiber optic, twisted pair	2.5M	No	255	4, 8 or 16	508	Resource Management System/ Extended Architecture, MS-DOS	NETBIOS	X.25, IBM 3270, Digital Equipment Corp. VT-220	\$11,000
Gateway Communications, Inc. Irvine, Calif.	G/Token-Ring	802.5	IBM PC XT, PS/2	Twisted pair	4M	Yes	260 with shielded, 72 with unshielded	4 or 8	2,048	NetWare, OS/2 LAN Manager	NETBIOS	X.25, asynchronous	\$25,700
IBM White Plains, N.Y.	IBM PC LAN Program Version 1.3	802.5	IBM PC, PC XT, AT, PC/XT-286, PS/2, RT PC	Twisted pair, fiber optic	4M, 16M	Yes	64	8	4K (4M bit/sec) 17.9K (16M bit/sec)	PC LAN Version 1.3	NETBIOS, LLC, SNA, SMB, TCP/IP (with RT PC), MAP (with IBM 8232)	3270, asynchronous, Token-Ring, DEC VT-100	\$33,000 for 4M bit/sec. \$40,800 for 16M bit/sec
Madge Networks, Ltd. Roanoke, Va.	802.5 Token Ring	802.5	IBM PC XT, AT, PS/2	Twisted pair	4M	Yes	260	4 or 8	4K	NetWare, VINES, PC LAN, Madge Netserver	Any using 802.2 Data Link Control or NETBIOS	None	\$30,800
NCR Corp. Dayton, Ohio	NCR Token Ring System	802.5	NCR	Twisted pair	4M	No	260	8	2K	NetWare, PC LAN, NCR LAN Manager	NETBIOS	None	\$30,000
Proteon, Inc. Westborough, Mass.	ProNET-4	802.5	IBM PC, PC XT, AT, PS/2	Twisted pair, fiber optic	4M	Yes	260 with shielded, 72 with unshielded	8	4K	NetWare, VINES	TCP/IP, OS-supported	None	\$28,600
	ProNET 10	Proprietary	IBM PC, PC XT, AT, PS/2	Twisted pair, fiber optic	10M	Yes	255	4 or 255	2K	NetWare, VINES	TCP/IP, OS-supported	None	\$22,600
Quam Corp. Minneapolis	Arcnet Interface	Proprietary (Arcnet)	IBM PC XT, AT, PS/2	Coaxial, fiber optic, twisted pair	2.5M	No	255	16	508	NetWare, any Arcnet compatible	NA	None	\$6,400 (coaxial); \$11,200 (fiber optic); operating system not included
Thomas-Conrad Corp. Austin, Texas	TC Series	Proprietary (Arcnet)	IBM PC AT and Intel Corp. 80386-based	Coaxial, fiber optic, twisted pair	2.5M	No	255	8, 16 or 64	508	NetWare, VINES	Internetwork Packet Exchange/ Sequenced Packet Exchange	None	\$14,000 (8-port MAU); \$16,000 (16-port MAU)
3Com Corp. Santa Clara, Calif.	TokenLink Adapter	802.5	IBM PC XT, AT, PS/2	Twisted pair	4M	No	260 with shielded, 72 with unshielded	4	4K	3+	NA	None	\$25,000
	TokenLink Plus	802.5	IBM PC XT, AT, PS/2	Twisted pair	4M	No	260	4	4K	3+	NA	None	\$38,700
Waterloo Microsystems Norcross, Ga.	Port Lite	802.5 and proprietary (Arcnet)	IBM PC XT, AT, PS/2	Twisted pair	2.5M, 4M	No	5	8	498 (Arcnet); 1,015 (token ring)	Port Lite	Proprietary	None	\$1,745 (5-user network)

LLC = Logical link control

MAU = Multistation access unit

NA = Information not available

NetWare = Novell, Inc. operating system

SMB = Server Message Block

3+ = 3Com operating system

VINES = Banyan Systems, Inc. operating system

* Price reflects a network with 32 terminal interface cards or MAUs capable of supporting 32 terminals, local net software and the network operating system.

This chart includes a representative selection of vendors in the token-ring local net market. Most vendors offer other token-ring local nets, and many vendors not included offer a full range of competitive products.

SOURCE: TMS CORP., WAYNE, PA.

(continued from page 39) to be on the ring simultaneously.

While ETR will speed throughput, it might also have an adverse effect on the eight-level priority scheme token ring uses to determine which station gets the token. For example, if a token is issued with a Level 4 priority, only a station with the same priority or higher can seize it as it circulates. As the token passes higher priority stations, those stations can place a reservation request in the frame's reservation field that demands that the next token issued

have a higher priority. When the token returns to its originating station, the station issues a token with a higher priority.

The downside of ETR is that it may adversely affect the ability to establish priorities. With ETR, if a station doesn't receive the header of the transmitted frame prior to releasing the token, the priority of the passed token will be the same as that received by the station transmitting it.

LanQuest Group's James doesn't believe ETR will present much of a problem with priority

handling. "Only a small percentage of reservations carry high priorities," he says.

Busmaster, offered by Proteon, will also speed overall throughput on token-ring nets. Busmaster, an add-on card that works with the Micro Channel bus architecture of the IBM Personal System/2, achieves faster transfer rates by taking control of the bus and transferring data directly to main memory without using the personal computer's microprocessor. Proteon claims that data transfer is 20% to 60% faster

with Busmaster than with standard 16M bit/sec or 4M bit/sec adapter boards.

Potential rival

Some people think FDDI will be the ultimate backbone and that 16M bit/sec Token-Ring is too little too late. FDDI specifies a 100M bit/sec speed and a redundant secondary path. It permits a backbone length of up to 100 km and can connect as many as 500 stations. FDDI also has eight levels of asynchronous transmission priorities and guarantees a mini-

mal amount of synchronous bandwidth for each station.

Whether FDDI is the backbone of choice depends on the application and the cost per connection. "Right now, FDDI is cost-prohibitive for multidrop [networks], but it's good for interconnecting networks and hosts," James says. (The per-drop cost for a host-to-host application, incidentally, is about \$10,000.)

Proteon's marketing vice-president, Nate Kalowski, says, "Until the costs come down, I see FDDI mainly as something to

Go to AT&T's Education and Training courses.

Get your free AT&T Education and Training course catalog by calling 1 800 554-6400 Ext. 5237 or fill out and mail this postage-paid card.

Phone No. () _____
 area code

MR. Name MS.

Title _____

Company _____

Address _____

City _____

State _____ Zip _____



AT&T
The right choice.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 279 BRIDGEWATER, NJ

POSTAGE WILL BE PAID BY ADDRESSEE:

AT&T Education and Training
Room 13C66
55 Corporate Drive
Bridgewater NJ 08807-9903

IBM responds to Token-Ring critics

continued from page 38

lose their cache, network flooding occurs, and restarting may be impossible.

IBM: The end station software that determines routes makes multiple attempts, if necessary, to discover a route. These attempts are paced and occur only during the initiation of the connection. This process, even with multiple stations, requires little of the network bandwidth.

Claim: Source routing is slow because the bridge must examine the routing control field of each packet to make a packet-forwarding decision. It must sequentially scan the field for bridge number and ring number for each hop in the network.

IBM: With source routing, one bit is

used to indicate whether a route is present in the frame. The bridge adapter hardware tests for the presence of this indicator as well as for ring speeds. Therefore, only frames being routed are examined further by the bridges; on-ring traffic is not processed by the bridge.

Claim: The Token-Ring Network Bridge requires manual reconfiguration after the network is changed.

IBM: The bridge does not have to be manually reconfigured after network changes. One of the advantages of source routing is that the bridge doesn't have to learn the location of every station in the network. Instead, the end station software determines and maintains routes used by logical connections.

Claim: Source routing inhibits or hinders the ability to interconnect differ-

ent types of local networks.

IBM: Source routing does not contain any inhibitors to the interconnection of different local networks. The interconnection cannot be transparent since the interconnection mechanism must account for the different frame formats that each local network supports.

Claim: Under the Token-Ring, Microsoft Corp.'s MS-Net can't run on anything larger than an Intel Corp. 80386-based platform. It isn't supported on the Application System/400 or on 370 architectures.

IBM: The server functions that operate on each of those processors have been optimized for those environments and in response to customer requirements. All three processors attach to the Token-Ring Network and can be used by workstations attached to the ring.

Claim: It's almost impossible to link multiple 80386s because of the difficulty in synchronizing multiple sub-versions of the data base among servers.

IBM: In April 1987, a planned enhancement to OS/2 Extended Edition Data Base Manager was announced; this upgrade will link data bases on multiple OS/2 servers (80286- and 80386-based).

Claim: The Token-Ring Network does not allow local network management or administration from a central location.

IBM: One of the strengths of the Token-Ring Network is that dispersed local networks can be managed from a central point. IBM LAN Manager Version 2.0 provides the end user with a full-screen interface for local net management operation in a multisegment bridged local net.

—John Hunter

connect mainframes, but eventually it could also be useful for connecting high-speed graphics stations."

Russ Sharer, marketing director for Communication Machinery Corp., a Santa Barbara, Calif.-based Ethernet product vendor, says FDDI's cost will make it the last resort for many companies. "When Ethernet runs out of bandwidth, 16M will likely be the next choice," he predicts.

The only FDDI product currently on the market is the System Finex FX 8210 from Fibronics International, Inc. That unit is an 802.3 Ethernet-to-FDDI bridge that operates on the media access control level and has a packet filter rate of 10,000 packet/sec. Judging by the number of sales this product has rung up since its debut last fall, FDDI is more than a technical curiosity.

"We've installed about 50 [FX 8210s] worldwide since December," states Fibronics Product Manager Greg Koss, "and interest has been very strong." Koss says many installations are in Europe and the Far East, but several are also in the U.S. He declined to name the sites.

In summary, while proprietary and 802.4 local networks are still very much with us, recently they've been overshadowed by interest in the 16M bit/sec Token-Ring and, to an extent, by FDDI. The latter, however, is just beginning to enter the market; it will be some time before workstation applications appear and the cost per drop becomes affordable.

The 16M bit/sec Token-Ring is the latest industry hot button and for good reason. It allows hierarchical networking to be built using 4M bit/sec local networks, and, if LanQuest's performance figures are correct, it will outperform Ethernet by at least 3-to-1. With ETR, IBM appears to have eliminated the latency problem plaguing Token-Ring, and by allowing more than one message frame to be circulating simultaneously, ETR also increases bandwidth utilization. Whether or not it allows ring efficiency to top 95%, as IBM claims, remains to be seen.

Other points open to question are the criticisms levied at 16M bit/sec Token-Ring by those who favor Ethernet. Most deal with the ability to network 4M bit/sec and 16M bit/sec local networks, especially in light of the bridges available and the source routing protocol employed.

Will token ring, with its increased bandwidth and performance boosters such as ETR blow away Ethernet? If cost is the name of the game, don't bet on it. Ethernet is less expensive now on a per-connection basis, and its vendors are in a position to wage a price war. But if heavily loaded networks and large packets are the order of the day, users may be giving IBM a ring. □

Do your boss a favor. Don't go to work.



You might accomplish more at an AT&T Education and Training course. Fact is, the time you spend with us can improve the rest of your career.

We'll show you more efficient, more competitive and more profitable ways of using communications to do business.

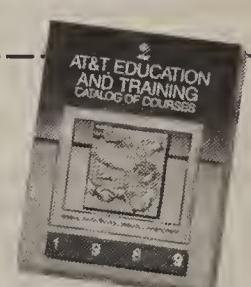
Current information on evolving issues, trends and techniques is yours for the asking. Business Management. Networking. Voice and Data Communications. UNIX®. AT&T Computers. We've even included hands-on training programs for AT&T equipment.

Our curriculum of over 200 courses probably has a program that's right for you—whatever your position and no matter what your business.

Call 1 800 554-6400 Ext. 5237 now, for a free AT&T Education and Training course catalog. Or fill out and return the coupon immediately.

This is one case where your boss actually wants you to miss work.

AT&T
The right choice.



Go to AT&T's
Education
and Training
courses.

For your free course catalog call
1 800 554-6400 Ext. 5237 or fill out this coupon
and return it to:
AT&T Education and Training, Room 13C66,
55 Corporate Drive, Bridgewater, New Jersey
08807-9903

Phone No. _____
area code _____
MR. Name MS.

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

© 1988 AT&T

AT&T EDUCATION AND TRAINING
Keeping you on top of a constantly changing world.

AT&T Education and Training, Room 13C66, 55 Corporate Drive, Bridgewater, NJ 08807-9903.

The telemanagement symphony

continued from page 35

When placed at a remote site to be polled by the telemanagement system or when used as a direct buffering device, the equipment should include several important features. LED capacity thresholds allow users to know how full the device's memory is. Error checking of data, battery backup in case of failures, format compatibility and translation and internal modems also offer advantages. Each device must be defined for its specific use, either as a simple buffer, a remote collection device or a remote device

Micro XL; MVS and VM for IBM mainframes; VMS for the Digital Equipment Corp. VAX; and ITOS for NEC computers.

Telemanagement trends

Today's trends in technology — fourth-generation languages, portability, relational data bases, distributed data processing, local networks and artificial intelligence — can be overwhelming. But they also offer the telemanagement user new functionality and control. The newest features of telemanagement software pro-

erating environments. Application development can proceed more quickly because the programmer is more concerned with the functionality of the program than with the technical aspects of the hardware on which it runs.

To the end user, an application written in a fourth-generation language provides easy access to data, more control to set up applications and extensive query functions.

The use of fourth-generation languages provides maximum flexibility by allowing ad hoc report generation and ad hoc inquiry. In telemanagement applications such as inventory, work

tem in each of the environments.

Portability has obvious advantages; it allows the system to grow with the organization. But potential buyers must assess the integrity of the product to ensure that the system and support do not try to be all things to all users.

Distributing the data

End-user market studies conducted by The Lido Organization, Inc. reflect a definite increase in the use of distributed data processing in many organizations. For example, while call-accounting functions commonly reside on a mainframe, running facilities management functions at the

communications systems and their vendors.

In the management of corporate information networks, growth in decentralized operations accompanies growth of centralized control and management. The need for both environments also stimulates the need for distributed data processing as applied to telecommunications and network management.

Conclusion

The number of decisions today's telecommunications manager must make is increasing every day. Technology is expanding the corporate role of telecommunications, giving the telecommunications manager more of a say in setting strategic directions for the company. But the merging of computers and communications makes it necessary that the telecommunications manager acquire yet another level of knowledge — the nature of data processing approaches and computer technologies.

Both telecommunications professionals and traditional MIS staff must embrace the new technologies and their possible uses. If a proper decision regarding telemanagement system configuration is made from the outset, that system will not only enhance the telecommunications function, it will also advance the career of the individual implementing it.

Letters

continued from page 31

marketplace are governed by competition. Regulatory restraints — especially when applied unequally — are plainly inappropriate.

Lawrence Garfinkel
Vice-president
AT&T's Business
Markets Group
Basking Ridge, N.J.

Micro-to-mainframe facts

The article in the recent issue of *Network World*, "From emulation to cooperative processing" (Jan. 23), regarding micro-to-mainframe communications links, was very well-presented. I really appreciate that the ideas presented have never been discussed openly in the trades.

LU 6.2 has not yet received wide acceptance within the user development community, but some publications seem so intent on forcing their readers to accept the technology that they editorialize.

I believe you very accurately reported what is happening in today's world. This type of reporting is very beneficial to all who rely on trade publications for an accurate synopsis of trends.

Thank you for your time and consideration.

Stan King
Executive vice-president
Mackensen Corp.
Santa Monica, Calif.

that may include some reporting or printing capability at the remote location.

The right operating system

Users must also choose the proper operating system for their needs. All computer systems use either one particular operating system or accommodate a variety. The final system configuration will indicate vendor options. But at the planning stage, users may still choose an operating system that both enhances their particular needs and points to preferred vendor selections.

Basically, the operating system is the supplied software or firmware that makes the hardware function and makes the computer's power available to the user. Essentially working as a resource manager, the operating system defines user interfaces, allocates shared resources among users, facilitates I/O and permits users to recover from errors. This type of resource manager will then interface with system users, application programmers, software programs and hardware.

Some common operating systems are: MS-DOS; PC-DOS for IBM Personal Computers and compatibles; Unix for AT&T and HP computers, and NEC Corp.'s

vide end users with both great challenges and opportunities.

The trends we see today basically have one common theme: Telemanagement is still a relatively new technology, and therefore, users seeking management software are not always sure of the applications the system will have to support. A system purchased to run on a microcomputer may eventually need more capacity or processing power as the organization grows. Built-in reporting functions may not provide all the types of information users may need once they become more familiar with telemanagement opportunities.

With increased automation and centralized management comes a need to pass data to other systems or to consolidate billing at a central mainframe location. With the growth of the telemanagement industry and the increased capabilities of the hardware and software itself, users are seeking new strategies to implement telemanagement.

New languages

Very high-level languages, also known as fourth-generation languages, such as Informix, Oracle, PRO IV and Paradox, are machine-independent languages that can run in many different op-

order, cable and trouble tracking, the relational query functions can be very desirable. Fourth-generation languages also facilitate portability, the ability to change operating environments with a minimum of disruption.

While the fourth-generation language is quickly becoming an industry buzzword, users should remember that certain functions, such as call costing and sorting, can be better addressed with traditional hierarchical data base structures. Certain vendors have begun to mix applications in different programming languages to better facilitate the functions.

Portability

Today's rapidly changing technological environment and increasing reliance on data obtained from application programs make portability increasingly important. Portability can refer to either a portable language (such as a fourth-generation language) or a portable software package system that can run on different types of computer hardware. When looking into a product that is said to be portable across environments, users must ascertain whether the system is written in a portable language and whether the vendor has truly tested and documented the sys-

tem. The processing functions can be made easier either by using a system interface that can pass data to the mainframe without redundant entry or by distributing the functions of telemanagement across various operating platforms.

Additional studies indicate growing requirements for interfaces into other information systems such as links to personnel, general ledger, accounts payable and accounts receivable, security, and network management.

The emergence of electronic data interchange services and standards will also greatly affect the telemanagement industry. While a good deal of work has already been proposed regarding electronic billing by vendors, end users see benefits in electronic transfer of service orders and trouble tickets. This capability could speed resolution as well as keep the client informed of delivery dates and escalation procedures.

In a technological environment that is quickly becoming more and more computer-driven, the ability to distribute data across many domains gives the end user even greater flexibility and enhances the level of management control over critical

Novell to disclose partners

continued from page 1

sible Unix/NetWare licensees are Digital Equipment Corp., Unisys Corp. and TOPS, a Sun Microsystems company.

For users, broad vendor acceptance of Open NetWare would link NetWare local nets and Unix environments. Open NetWare running on Unix hardware could be positioned as a gateway between personal computers on a NetWare local net and workstations or minicomputers in a Unix environment.

"By porting NetWare to run on Unix, users will be able to significantly increase the size of their networks because it's a more powerful operating system," said Lee Doyle, manager of the LAN Program at International Data Corp., a market research firm in Framingham, Mass. "Running NetWare on specialized Unix machines will increase the potential for developers to create back-end network applications such as database engines and gateways."

With its Unix-based NetWare, Novell is mounting a counteroffensive against the Unix-based OS/2 LAN Manager versions being developed by AT&T and Hewlett-Packard Co.

Those two companies may find it difficult to dislodge Unix-based NetWare, Doyle said.

The Open NetWare announcement is just one of a series of moves planned by Novell. The vendor is set to announce NetWare 386, a network operating system for file servers based

on the Intel Corp. 80386 microprocessor.

Last week, Novell also said it plans to support Sun's Network File System (NFS) (see "Novell joins supporters of Sun's NFS," page 5).

NetWare 386 will make it possible for users to support multiple protocols on the same Novell network — much like what Microsoft Corp. has proposed to do with OS/2 LAN Manager.

That Novell product reportedly will support Transmission Control Protocol/Internet Protocol. NetWare currently supports Novell's proprietary Sequence Packet Exchange/Internetwork Packet Exchange protocol and IBM's Network Basic I/O System.

"NetWare 386, when it ships this fall, will give 3Com Corp.'s 3+ Open a lot of problems," said John McCarthy, an analyst at Forrester Research, Inc., a market research firm in Cambridge, Mass. "We expect it will offer twice the performance of 3+ Open and be 20% to 30% faster than NetWare 286."

Novell's support of NFS makes it possible for users on a NetWare local net to communicate with any other processor — including Unix workstations and minicomputers — that supports NFS.

Beating around the bush

While Novell would not confirm the Open NetWare announcement, Mark Calkins, vice-president of the company's

software group, said Novell's goal is to offer versions of NetWare that run on Unix-based minicomputers and workstations positioned as servers in a local net.

NCR confirmed that it will license Open NetWare. Sun and DG did not comment by press time.

"NCR, with our standard Unix Tower product and Unix expertise, was among the first vendors to work with Novell in porting NetWare to the Unix System V.3 environment," said Timothy Davis, assistant vice-president of networked systems at NCR in Dayton, Ohio.

The Open NetWare product is written in the C programming language, which makes it possible for NetWare OEMs to quickly port it to run under their own Unix versions and add functionality.

Two NetWare versions

Novell and the Open NetWare OEMs will eventually market two interoperable versions of NetWare. One version, which will run under Unix as an application, will support a Unix server on a NetWare local net.

The other version will run stand-alone in a server, positioning it as a file server. Novell will boost performance of the stand-alone version over current NetWare offerings by adding operating system features.

Pricing on the NetWare versions of Unix will be set by the OEM vendors. Analysts expect the products to ship in the second half of 1989. □

Companies mask ANI from callers

continued from page 1

titled "Preparing for Integrated Services Digital Networks" in December in Toronto.

A conference attendee asked Zatarga how customers reacted to agents answering calls, "Hello Mr. Jones."

"That was exactly the way one of our agents answered an ISDN call," Zatarga recalled. "There was about a 10-second pause, and then the caller asked, 'How did you know that?'"

In his presentation, Zatarga said TRS now avoids identifying callers by name. "We have changed the way we answer the [telephone]," he said. "We know who they are, but we still hunt for information" from callers as if we had to identify them.

Although TRS has since denied that it used ANI to identify callers by name and that it received negative feedback from cardholders, sources close to the project who requested anonymity said numerous users reacted unfavorably to personalized greetings. TRS "learned that you don't answer the telephone with the customer's name," one source said.

Other users who foresaw problems with ANI have gone to great lengths to mask the fact that they

know who callers are before they identify themselves.

American Transtech, a wholly owned subsidiary of AT&T, was the first U.S. company to test AT&T's ISDN Primary Rate Interface. The Jacksonville, Fla.-based firm — which provides telemarketing and information management services to AT&T and other companies — processes one million transactions a day, making it the nation's fourth largest telemarketing company.

The many faces of ANI

American Transtech uses ANI to handle its staggering call volume more efficiently. The feature is also used as the basis for what the company calls a "dealer locator" service, which it provides to a number of companies. In addition, ANI lets American Transtech determine the location of callers and reduce the time it takes to identify the product or service sites closest to the caller.

The company does not, however, greet callers by name. "We could do it, but we don't want to let customers know we can capture their telephone number," said an American Transtech spokesman. "We don't use [specialized greetings] because it would intimidate callers."

Nice Corp., a 2,000-agent telemarketing service bureau based

in Ogden, Utah, uses the Primary Rate Interface in its private network and plans to employ ANI when the service becomes available in that state. Richard Clements, a telecommunications manager and engineer with Nice, said the firm will consider ANI privacy issues before deciding how to implement the feature.

Besides the risk of alienating customers with ANI, there is a pervasive fear among prospective ANI implementors, such as Nice, that callers will raise legal objections to ANI once they know how it works. People with unlisted telephone numbers are expected to spearhead that movement.

Clements, who spoke at the same ISDN conference as Zatarga, fielded questions regarding privacy with ANI. When an attendee asked Clements about the issue, he replied, "We intend to respect the privacy of callers with unlisted telephone numbers."

But this may be easier said than done, according to Huel Halliburton, a communications manager with Centel Electric in Great Bend, Kan. Halliburton said central office switches equipped to support equal access deliver the phone numbers of callers with both listed and unlisted telephone numbers to companies that use the ISDN feature. □

Bankers win concessions

continued from page 1

contracts with local exchange carriers. The key is that banks are seeking special treatment instead of waiting for carriers to approach them. "End users have to be involved on their own behalf to ensure they enjoy the benefits of competition," according to conference speaker William Booth, a partner with the San Francisco law firm of Jackson, Tufts, Cole & Black.

Last year, one user, Irving Trust Co. of New York, pitted MCI Communications Corp. against AT&T to obtain a new international calling service.

Irving Trust wanted an AT&T Megacom-like service to reduce the \$3 million a year it was spending on AT&T's switched international service, said John Compitello, Irving Trust's vice-president for telecommunications. After Irving Trust got a bid from MCI that met most of its requirements for international service, Compitello asked AT&T for a proposal.

Fearing the loss of international calling revenue, AT&T accelerated development of what it now calls AT&T World Connect service, he said.

With AT&T World Connect, Irving Trust uses a T-1 line provided by Teleport Communications to access an AT&T central office that supports international traffic. The service is 15% less expensive than dial-up service, and T-1 access cuts call setup time from 15 or 20 seconds down to seven seconds, he said.

"If AT&T didn't come up with this, we would've used MCI," Compitello said. "So, we're going to leverage AT&T to give us whatever other services we can get them to offer."

Compitello said users should pit carriers against one another to obtain lower prices for existing services, as well. He suggested that a user get a rate quote from one carrier and urge AT&T to use Tariff 15 to meet or beat that price. Under Tariff 15, AT&T can offer services at below-tariff rates to combat discount rates offered by other carriers, such as MCI and US Sprint Communications Co.

AT&T's Tariff 12 is used to offer custom voice and data networks to large users at volume discounts. The carrier has filed Tariff 12 plans for such users as General Electric Co., Ford Motor Co., E.I. du Pont de Nemours & Co., American Express Co. and American Airlines, Inc.

AT&T recently said it may file as many as 200 Tariff 12 custom network deals this year ("Top AT&T executive talks tough," NW, Jan. 23). Henry Levine, a partner with the Washington, D.C.-based law firm of Morrison & Foerster, said this indicates AT&T will target a wider group of users with Tariff 12.

Levine said he believes AT&T is lowering the amount of money

a customer must spend before being considered a candidate for Tariff 12 from between \$10 million and \$20 million a year to between \$5 million and \$10 million a year. That adjustment has increased the number of banks eligible for a Tariff 12 offering from about 10 to nearly 100, he said.

A representative of San Francisco-based Bank of America National Trust & Savings Association said the bank is currently preparing to go after a Tariff 12 offering. "We've made several attempts at Tariff 12, and we're going after another one," said John Macri, vice-president for telecommunications at the bank.

The Federal Communications Commission has allowed Tariffs 12 and 15 to go into effect while it investigates their legality. If the FCC were to rule against the tariffs, users who signed on for such deals could wind up paying regular tariffed rates.

Compitello said users should pit carriers against one another to obtain lower prices.



"I'd be willing to take that crap shoot," Compitello said.

Others agreed. "The worst case would be that you pay the regular tariff rate you would have paid to begin with," said Gerald Brittain, vice-president for telecommunications at Dominion Bankshares Corp. in Roanoke, Va.

But Bank of America is not stopping at a Tariff 12 plan. The bank is working with Pacific Bell and the California Public Utility Commission (PUC) to pave the way for Pacific Bell to offer volume discounts for its services.

"Why can't you get a volume discount from a local carrier?" Macri asked. Bank of America has gone before the California PUC to argue in favor of volume discount plans for large users. The California PUC agreed to allow Pacific Bell to negotiate volume discounts for its Centrex service.

Brittain recently took advantage of increased competition to get regional long-haul carrier SouthernNet, Inc. to offer fractional T-1 service. The bank is using fractional T-1 service to replace a total of 10 AT&T voice tie lines and 56K bit/sec data circuits between headquarters in Roanoke and branch operations in Nashville.

SouthernNet was willing to sell the fractional T-1 service. AT&T wanted to retain the bank's business but failed to bid for the fractional T-1, Brittain said.

With carriers becoming more aggressive, "it's like a buyer's market in real estate," Brittain said. □

DATA SECURITY

SINGLE CALL SECURITY

Effective One-Call Security
For Dial-up Communications

- * One-Call Authentication in Seconds
No Call Back Delays
- * Built in 2400bps V.22 bis Modem
- * Comprehensive Audit Trial
- * Auto Disconnect upon Unauthorized Entry
- * Up to 100 Passwords 1-12 Characters

SCS100**"NEW"**

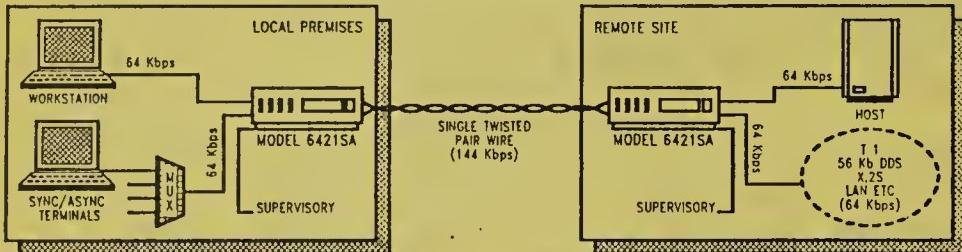
Call For Special Introductory Offer

Optimum Electronics, Inc.
425 Washington Avenue - P.O. Box 250
North Haven, CT 06473
Phone: (203) 239-6098 FAX: (203) 234-9324

Circle Reader Service No. 34

DUAL-CHANNEL HIGH-SPEED MODEM

Tired of Rewiring Digital Networks?



Create two high-speed digital channels on twisted-pair wire with Metaplus' ISDN-format modem/multiplexer ...

Features

- o Pays for itself in wire savings
- o Transmits at 144 Kbps on a single twisted wire pair up to two miles
- o Creates two data and one supervisory channel in ISDN 2B+D format
- o Accepts synchronous or asynchronous data up to 64 Kbps in each data channel
- o Internally adapts to lower port speeds
- o Uses separate supervisory channel for network management and diagnostics

Applications

- o Private data networks
- o SNA network connections
- o LAN or digital PBX connections
- o Workstation or CAD/CAM connections
- o Terminal/PC to host connections
- o T1/DDS circuit extensions

Call today for more information
(408) 257-5569 Fax (408) 255-4576

METAPLUS, 5339 Prospect Road, Suite 312, San Jose, California 95129

Circle Reader Service No. 22

EQUIPMENT FRAMES

DATA CONNECTIONS

3174/3274 CONTROLLER STACKING FRAME WITH ADJUSTABLE SHELVES



We Accept Visa and Master Card

Call or Write: Nancy Gibbs

DATA CONNECTIONS

P.O. Box 6438, High Point, NC 27262-6438

919/884-1855

FAX # 919/884-2226

Call 1-800/234-1855

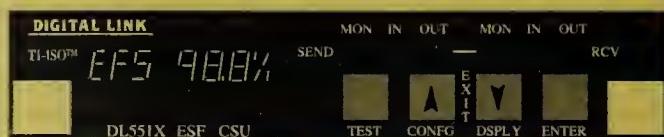
Circle Reader Service No. 35

NETWORK WORLD • JANUARY 20, 1989

44

EXTENDED SUPERFRAME CSU

T1 Performance Data Revealed

**DL551X XTENDED™ CSU**

- Advanced user interface
- Front panel access to all ESF registers
- Full compliance with AT&T 54016 & T1/E1
- No confusing banks of LED's
- Full diagnostics including jack access
- Connection to terminal or network management without any required extra equipment

DIGITAL LINK

CALL (408) 745-6200 TODAY

Circle Reader Service No. 30

IBM CABLING

**NEW SOURCE FOR:
DPC CONNECTORS
DPC CABLE ASSEMBLIES**



**WE HAVE THEM
TODAY IN STOCK!**

PLEASE CALL FOR ORDERS AND/OR
OUR COMPLETE CATALOG FOR
"IBM CABLING SYSTEM"
PRODUCTS.
1-800-XXX-XXXX
DISTRIBUTORS AND
CONTRACTORS INQUIRIES
ARE WELCOMED

RadCom

1841 Broadway, Suite 609 • N.Y., New York 10023
Fax: (212) 956 104 • Tel: (212) 956 8100

Circle Reader Service No. 31

Advertise In ActionCenter

Ads run for entire month (4 or 5 issues)

3 sizes available:

2" x 4" -- \$1150 per month

4 13/16" x 4" -- \$1350 per month

4 13/16" x 8" -- \$2700 per month

Call for information:

Joan Bayon Pinsky 800-343-6474 (In MA 508-820-2543)

Pacific & Mountain: Call Susan Egan 714-250-3006

MODEMS



Data Communications Products and Service
P.O. Box 578, Ridgefield, CT 06877 • 203-438-9897

Serving the NORTHEAST for over 7 years with competitive pricing and dependability, we are expanding our service NATIONWIDE.

PREVIOUSLY OWNED EQUIPMENT NOW AVAILABLE FOR IMMEDIATE DELIVERY WHILE SUPPLY LASTS:

RACAL VADIC VA3467 Cards	\$199.00
RACAL VADIC VA1680 Chassis	\$275.00
RACAL VADIC VA2450P	\$395.00
RACAL MILGO 122 RALA	\$300.00
CODEX 9600 LSI	\$599.00
CODEX DIGITAL SHARING DEVICE	CALL - 203-438-9897
CODEX 2000 NEST 115V (NEW)	CALL - 203-438-9897
WANG WORK STATION	CALL - 203-438-9897
WANG LASER PRINTERS	CALL - 203-438-9897
GDC 212 A/L RACK OR STANDALONE	\$375.00
PARADYNE LSI 96	\$150.00
DON'T SEE IT HERE?	CALL - 203-438-9897
WE HAVE CABINETS, CABLES, CONNECTORS, TEST EQUIPMENT, ETC.	
CALL GRAYCOMM FOR COURTEOUS PROMPT RELIABLE SERVICE	
203-438-9897	

Circle Reader Service No. 32

NETWORK CONTROL

REMOTE SWITCHING

Dataprobe Knows Your Application and Has Off-the-Shelf and Custom Product Solutions.



AUTOMATIC OPERATION
SWITCH ON CONTROL LEADS
HIGH/LOW. COMPARES MULTIPLE SIGNALS. TIME DELAY.

REMOTE CONTROL
TONE DIAL PHONE W/VOICE.
EXTERNAL CONTROL SIGNALS
ASCII DATA FROM TERMINAL.



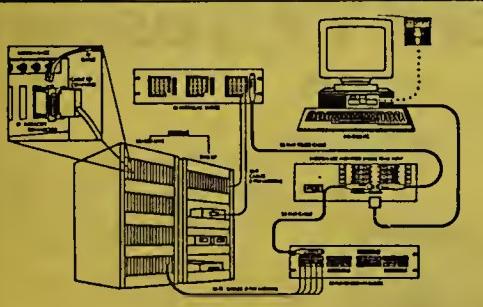
170 COOLIDGE AVENUE, ENGLEWOOD, NEW JERSEY 07631
PHONE (201) 569-6464 FAX (201) 894-0939

Circle Reader Service No. 23

RS-232
V.35
VF
DIAL
COAX
T-1
POWER
RJ-11
RJ-45
RS-422

A-B
A-B-C
X-OVER
1:N SPARE
ON/OFF

NETWORK MONITORING & CONTROL



MANAGE Your
Dial Up Modems
With our
NETWORK WINDOWS™
PC Based System

DAILY USAGE & ERROR REPORTS
AUTOMATIC BUSY OF "RING NO ANSWERS"
REAL TIME TROUBLE TICKETS
MODEM VENDOR INDEPENDENT

Call or write for information & DEMO Disk
See us at: ComNet Booth 3234 Washington DC Feb 6-8
Interface Booth 2419 New York City Mar 14-16

Communication Devices Inc.
1 Forstmann Ct.
Clifton, NJ 07011
201 772 6997

Distributors Welcome
Made in the USA

Circle Reader Service No. 25

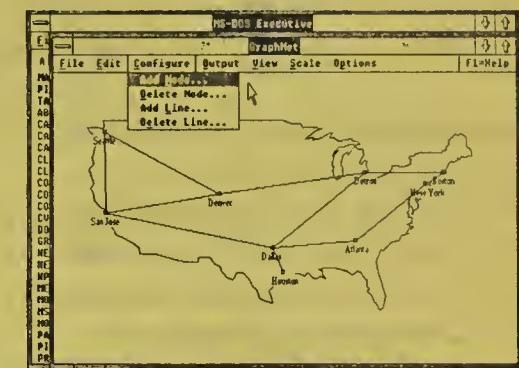
NETWORK PLANNING SOFTWARE

Manage and view your network on your personal computer with GrafNet's visual displays...

Features user friendly Microsoft Windows graphical interface. Built-in V&H database automatically converts NPA/NXX to an on screen graphical location.

Applications

- * Managing topology of private voice/data networks.
- * Planning traffic routing, network growth and consolidation.
- * Identifying network bottlenecks and expensive links.
- * Maintaining a network configuration repository.



Call or write for information and a free demo disk.

Price \$450 includes PC diskette and user's manual.

Network Dimensions, Inc.

5339 Prospect Road, Suite 122, San Jose, CA 95129, 408-446-9598

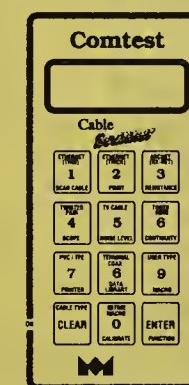
Circle Reader Service No. 33

NETWORK SCANNING AND MONITORING

Comtest Cable Scanner

Pinpoint Network Cable Faults Fast!

The Comtest Scanner is a monitor, fault finder, cable locator and much more. Helps you pinpoint the location of shorts, opens or breaks. Its 32 character display reports the fault in plain English "short at 306 ft". With an oscilloscope, Scanner's high speed, pulse generating circuitry gives a detailed view of the entire LAN including transceiver, terminator and multiple faults.



Included is Tracer for locating exactly where in the floor, ceiling, wall or patch panel the cable lies. Comtest Cable Scanner, Tracer and Operators' Manual are only \$1495.

- * Cable length measurements
- * Locate breaks, shorts, opens, bad crimps, etc.
- * LAN activity monitoring
- * Find cables in ceilings, walls, floors
- * Cable TV troubleshooting
- * Generate as-built drawings and specifications
- * Isolate faulty network interface cards
- * Very simple to operate

M-Test Equipment
P.O. Box 460008
San Francisco, CA 94146-0008
Outside CA: (800) 334-4293 Call for Info
Inside CA: (415) 861-2382
FAX: (415) 864-1076

Circle Reader Service No. 17

Free product and service information is right at your fingertips!

Network World's ActionCenter makes it easy for you to get the free information you need on products and services that can make a difference to your organization.

- * Use the Reader Service coupon in Network World.
- * Circle the Reader Service numbers that correspond to the advertisements in ActionCenter.
- * Fill out the coupon and send it to:

Network World
P.O. Box 5090, Pittsfield, MA 01203

And the information you want will soon be on its way to you!

The sooner you return the coupon, the sooner you'll have the information you need to make informed purchase decisions.

PC CONNECTIVITY

Let pcX²⁵
Turn Your PC Into a Remote
Interactive Workstation

Just pcX²⁵ software
and your modem.....
No PC bus card needed.

Network Certifications

- AcuNet
- Compuserve
- Datapac
- Globenet
- Infonet (Pending)
- Telenet
- Tymnet (Pending)

Stop making long distance phone calls.
One local X.25 Dial-up provides you with VT100 emulation to one or more Hosts. Attach the pcX²⁵ print spooler to your Host(s) print queues. Gateway your PC to your Wide Area Network and enjoy local access to your remote host mainframes.

List Price \$295 - Call for product information.
Tropical Communications Associates, Inc.
P.O. Box 7057, Delray Beach, FL 33484-7057, Telephone: 407/498-1302

Circle Reader Service No. 28

PC VOICE MAIL

**PC voice mail,
now only \$199.**

Watson[®], hailed by one reviewer as "the premier voice mail station" at \$498, is an even better value at \$199. Watson eliminates telephone tag and gives you big-system features like auto speed-dial, auto answer, message

**INCLUDES
HAYES[®]
COMPATIBLE
MODEM!**

1 (800) 6-WATSON (in Mass., (508) 651-2186). To order, call 1 (800) 533-6120 (in Mass., (508) 655-6066). Credit Cards Accepted.



Watson[®]

Natural MicroSystems Corporation

Circle Reader Service No. 29

Send For Free Info

For more information on any of the products and services advertised in NetworkWorld's ActionCenter, circle the Reader Service Numbers on this coupon which correspond to the advertisement of interest to you.

Complete the coupon information and mail to:
NetworkWorld

P.O. Box 5090, Pittsfield, MA 01203

(Expires 4/30/89)

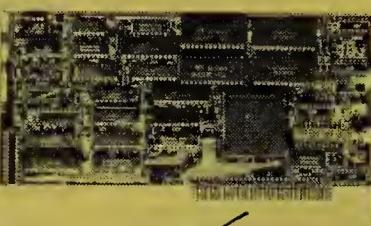
1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	
18	19	20	21	22	23	24	25	
26	27	28	29	30	31	32	33	
34	35	36	37	38	39	40	41	
42	43	44	45	46	47	48	49	
50	51	52	53	54	55	56	57	

Name _____
Title _____
Company _____
Phone () _____
Street _____
City _____
State _____ Zip _____
NW 2/20

PROTOCOL ANALYZER

**Turn your IBM PC into
a 3270 Coax Protocol
Analyzer and Controller.**

- Passive Monitor
- 3299 MPX, DFT, SNA, Host Response Time Analyzer
- Transmits Recorded Files
- Certification Library
- TwinaxScope Also Available



**Azure
CoaxScope**
Priced From
\$2,995.00
14 Day FREE Trial
Evaluation
(508) 520-3800

AZURE
TECHNOLOGIES
38 Pond Street, Franklin, Massachusetts 02038
FAX: (508) 528-4518

Circle Reader Service No. 20

ESF
SF
B8ZS
TDM
CRC6
ES
AMI
ISDN
Fr
Fs
PAM

T-CARRIER SEMINARS

An Introduction to the Fundamentals of T-CARRIER

These seminars, held nationwide, facilitate understanding of the fundamental issues and common stumbling blocks arising from the application of this voice-oriented pair-gain technology to the transmission of data.

Network managers, engineers, and craftspeople/technicians responsible for the planning, implementation, operation, or maintenance of T-CARRIER facilities will benefit from this seminar.

FOR SCHEDULE OR MORE INFORMATION CALL:

1(800)638-2049
In MD Call (301) 353-1550 (Becky Kessell)

Telecommunications Techniques Corporation
20410 Observation Drive
Germantown, Maryland 20874

Circle Reader Service No. 18

ADPCM
PCM
BER
ZBTSI
DM
BPV
SES
DS1
DS3
AIS

TESTERS

New Hand-Held T1 Testers

T-Tester - \$4,495

Full Function Test Set (8lbs.)



- * SF, ESF, B8ZS, SLC-96 Compatible
- * QRSS/BERT/User test patterns
- * Full duplex alarm monitoring
- * DSO Drop/Insert Capability
- * Signaling bits for all channels displayed simultaneously

Also available

T-Watcher - DS1 Monitor/Analyzer \$1495
T-Sender - DS1 Signal Generator \$495

For additional information

call 1-800-DIGILOG In PA 215-628-4530

DIGILOG® 1370 Welsh Road, Montgomeryville, PA
Circle Reader Service No. 36

NETWORKING MARKETPLACE

**Buy, Sell
Or Announce
Through
Network
World's
Classified
Section**

Buying or selling communications-related products or services?

Or do you want to announce an upcoming event or business opportunity?

If so, Network World's classified section is the right choice for you.

You'll reach more than 70,000 communications/networking professionals all of whom are buying decision makers.

And you'll reach them every week.

Find out just how effective and cost efficient Network World classified advertising can be.

For all the facts write or call:
Network World,
Classified Advertising,

Joan Bayon Pinsky,
375 Cochituate Road,
PO Box 9171,
Framingham, MA 01701-9171;
800-343-6474
(in Mass., 508-820-2543)
X755

Pacific & Mountain:
Susan Egan,
18008 Sky Park Circle,
Suite 100, Irvine, CA 92714;
714-250-3006

TRAINING

LAN ANSWERS

Considering a LAN? Already have one? Need answers about the purpose, technology and applications of Local Area Networking? Then give us a call for a free catalog featuring our LAN course and other computer-based data and telecom courseware.

TELETUTOR

COMPUTER-BASED TRAINING SERIES
**FOR FREE CATALOG
OF ALL OUR
COURSES CALL
(603) 433-2242
800-542-2242**

FAX COMM

FAXCOM 1000 + LINKS YOUR COMPUTER TO ENTIRE WORLD OF FAX

INCREDIBLE:

- Quality
- Performance
- Low Cost
- Ease Of Use

BISCOM, INC.
(508) 670-5521
85 Rangeway Rd Billerica MA

DATACOMM

Warwick Technical Services

- REPAIRS
- UPGRADES
- INSTALLATION
- CABLING

NEW-USED-BUY-SELL-LEASE

MICOM codex

paradyne AT&T

IBM Racal-Milgo

ARK CASE RIXON

UDS Universal Data Systems

NEW AND USED EQUIPMENT BACKED BY WARRANTY
NATIONWIDE SERVICE, MAINTENANCE AND INSTALLATION

(201) 586-3070 FAX 586-3080

Warwick DATA SYSTEMS, INC.
66 FORD ROAD, DENVILLE, NEW JERSEY 07834

SEMINARS

BROADBAND LAN TECHNOLOGY SEMINAR

ComNet Engineering offers an in-depth course on broadband LANs. This seminar is the first of its kind - *totally vendor independent*. The seminar will focus on the technical aspects of broadband theory - 802.7, MAP/TOP, and NTCA standards. It is intended for technicians and engineers who will be involved with the design, analysis, and maintenance of broadband systems.

The two day seminar includes rf broadband theory, design methods & principles, headends, installation, signal balancing, certification, maintenance, and applications of broadband data and video networks. Course materials and lunch provided.

DATE: MARCH 8-9, 1989 LOCATION: AUSTIN, TX
COURSE FEE: \$795.00 MARRIOTT AIRPORT HOTEL
For seminar info and registration contact John Gutierrez at:

ComNet ENGINEERING Co.
3310 Western Dr. Austin, TX 78745
512-892-2085

LANS

CAD/SUM II™ BROADBAND LAN DESIGN SOFTWARE

The Industry Standard Since 1984

Design Assistant software for End-users and system contractors! The package includes CATV equipment database, fully featured design assistant, graphic topology display of entire network, bill of material, design listings, set-up summaries, noise & distortion report, AutoCAD Interface and Template, and more. Very powerful "Tune Inbound Amplifiers" for automatic inbound setup. English/metric units are standard. Operates on any DOS environment with 640K.

Cable Technology Group
55 Chapel Street Newton, MA 02160 617 969-8552

NETWORKING CAREERS

NEED HELP?

Guess which newspaper was voted "most helpful" in the latest TCA Member Profile Study?

You guessed it - Network World. And you'll find Network World "most helpful" when you have to hire networking professionals.

Network World, the Users Choice, delivers your target audience every week.

Over 70,000 qualified networking professionals with an estimated pass-along readership of 230,000 every week.

Minimize your recruitment expenditures while maximizing your recruitment responses. For more information, or to place your recruitment ad in Network World, call Pam Valentinas at 800-343-6474 (in MA call 508-820-2543)

TELECOM SALES PROFESSIONALS

If you are a polished pro with a solid track record we would like to hear from you. We only place the best. Our prestigious clients know that! Vendors of Voice/Data products and services rely on TELEDATA for Account Executives and Sales Management. For the better positions on the East Coast contact:

Ed Freedman
TELDATA RESOURCES INC.
226 West 26th Street
8th Floor
New York, NY 10001-6702
212-924-9344
FAX 212-691-6452

Your Recruitment Ad Can Be Here For \$168.00

For Information Call Pam Valentinas at 1-800-343-6474 (in MA 508-820-2543)

LAN Sales Executives

For the finest Sales/Mktg. opportunities of your career contact:

Paul Churchill
VP Executive Search Div.
SALES CONSULTANTS (USA & International)
1707 H St., NW, Ste. 405
Washington, DC 20006
(202) 452-9105

ACCOUNT MANAGERS SALES AND MARKETING

TERRESTRIAL MICROWAVE AND FIBER OPTICS

This progressive telecommunications company has openings for Account Managers located in New York, Washington, D.C.; Dallas; Chicago; and Los Angeles. These positions will sell high capacity long haul voice and data transmission.

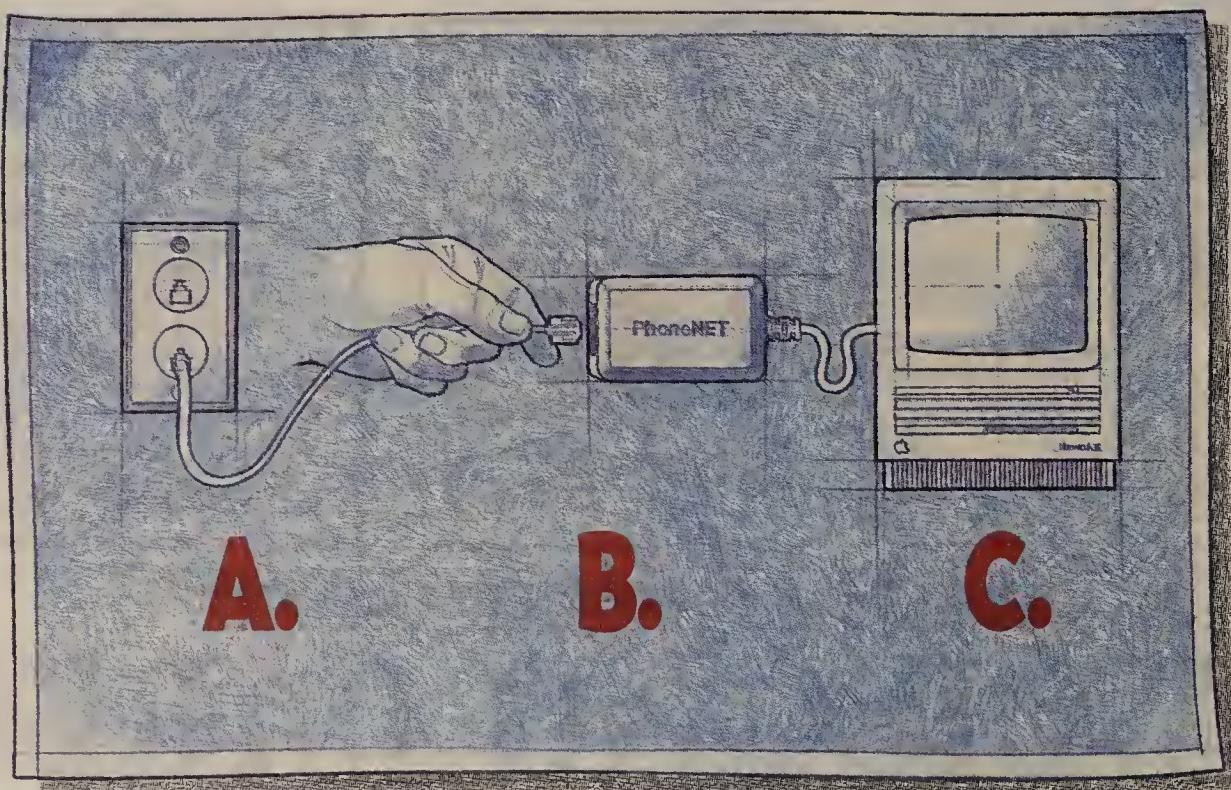
These positions offer extraordinary opportunities and challenges. Individuals chosen must have strong interpersonal and sales/marketing skills and a strong working knowledge of the telecommunications industry. Account Managers will develop new business with corporate and commercial customers.

Minimum qualifications will include a Bachelor's degree in Marketing or equivalent experience. Candidates must have at least 3 years proven successful sales/marketing experience in the voice & data telecommunications industry.

If you have the desire and the skills needed to become one of our valued employees, send your resume and salary requirements to:

COMMUNICATIONS TRANSMISSION INC.
Attn: Human Resources, AM-NW
3307 Northland Drive, Suite 500
Austin, TX 78731
NO PHONE CALLS OR AGENCIES PLEASE
Equal Opportunity Employer

Installment plan.



If you can plug in a telephone, you can install your own AppleTalk network. Our PhoneNET System makes it easy as A.B.C.

PhoneNET uses ordinary phone wire. No soldering. No rewiring. And it's so reliable, PhoneNET almost never needs servicing.

Our installment plan is flexible. PhoneNET fits any floor plan. It's expandable, too. By simply adding our StarController or PhoneNET Relay, you can link PhoneNET systems from different floors or buildings into one big network.

Call (415) 849-2331 for the Farallon dealer nearest you, and find out how little it takes to get started on the PhoneNET installment plan.

 **Farallon**™

2201 Dwight Way, Berkeley, CA 94704

FAX # (415) 841-5770. PhoneNET is a registered trademark, and PhoneNET StarController and PhoneNET Relay are trademarks, of Farallon Computing, Inc.
AppleTalk is a registered trademark of Apple Computer, Inc. © 1988 Farallon Computing, Inc.